

JPRS 82857

15 February 1983

# USSR Report

HUMAN RESOURCES

No. 76



FOREIGN BROADCAST INFORMATION SERVICE

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## LABOR

### ESTONIAN OFFICIAL DESCRIBES FARM WORKER UTILIZATION

Moscow SOTSIALISTICHESKIY TRUD in Russian No 10, Oct 82 pp 20-26

[Article by V. Konstantinov, chairman of the Estonian State Committee for Labor and Social Problems: "A Scientific Organization of Labor for Agriculture"]

[Text] The standard of living of the Soviet people and their well-being are largely determined by agricultural development. "In the future we will allocate major financial and material resources to the countryside and will continue the planned conversion of this sector to an industrial basis," stated the General Secretary of the CPSU and Chairman of the Presidium of the USSR Supreme Soviet, L. I. Brezhnev, at the 26th CPSU Congress. "But the center of gravity at present, and this is a distinguishing feature of agrarian policy in the 1980's, is to shift to the return on capital investments, the growth of agricultural productivity, to the deepening and improving of its ties with all the sectors of the agroindustrial complex."<sup>1</sup> The congress plans were further developed at the May (1982) Plenum of the CPSU Central Committee.

The USSR Food Program for the period up to 1990, as approved by the plenum, embodies the party's present agrarian policy. It outlines concrete measures of enormous significance and scope to realize the urgent demands of modern times. A major role is being assigned to the program for improving the organization of labor and the management of agriculture and to using the knowledge and experience of specialists. Our Estonia has also acquired such experience.

Recently the republic celebrated the 40th anniversary of the restoring of Soviet Power. Over these years, our agriculture has been transformed. Instead of the 144,000 individual farms in the bourgeois times, here now 309 highly mechanized kolkhozes and sovkhoses are successfully functioning. With a decline of 3-fold in the number of workers, the gross product of the sector has increased by almost double. The energy-to-labor ratio calculated per worker in the Tenth Five-Year Plan alone rose by 15 hp. From 1965 through 1980, the number of persons employed declined by more than one-quarter, while labor productivity on the kolkhozes and sovkhoses rose by 2.3-fold. At present, Estonia

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<sup>1</sup> "Materialy XXVI s"yezda KPSS" [Materials of the 26th CPSU Congress], Moscow, Politizdat, 1981, p 46.



is among the republics with the most developed, intensive livestock raising, where per 100 hectare of plowed lands there are around 85 head of livestock and over 1,000 quintals of milk are produced. This has been achieved primarily by the industrial management of agricultural work.

The March (1965) Plenum of the CPSU Central Committee was an important step in raising agriculture. After this in the republic a great deal was done to improve the economic mechanism, to fully mechanize the labor processes and to introduce new elements into the organization of labor and management on a scientific basis. For example, take the sphere of managing agricultural production on the rayon level. Other republics, over the past five-year plans we have specialized the given sector. At one time, this was done correctly. But now the negative consequences have become evermore apparent primarily due to the departmental isolation of the organized organizations. Practice has shown that specialization, even on a narrow basis, completely and fully justifies itself within a farm, where as a result all the sectors are under unified leadership of the kolkhoz or sovkhoz. It is a different question on the rayon level. Here scores of specialized organizations serving the kolkhozes and sovkhozes were quite often organized, but these worked "for themselves" and were guided by their own departmental interests.

Now the rural specialists have worked out a new structure for managing the rayon agroindustrial complex. This makes it possible to focus the efforts of all the labor collectives and each section of agricultural production on achieving an end result. This scientific system envisages the evaluation and payment for labor, for example, by a tractor driver not in terms of the number of tilled hectares, but rather in terms of the harvest yield. The new scientific organization of management was initially approved in Vil'yandiskiy and then Pyarnuskiy Rayon of Estonia. What did the experiment provide? For Vil'yandiskiy Rayon, during the Tenth Five-Year Plan, in comparison with the Ninth, meat production increased by 40 percent, milk by 20 percent and the average annual grain production by 39 percent. On the basis of analyzing this experience, it was decided to set up agroindustrial associations in all the republic's rayons.

It is important to emphasize that the new management system increases the role of the rayon level, its authority and responsibility. This fully conforms to the demands of the new USSR Constitution and to the decisions of the May (1982) Plenum of the CPSU Central Committee. The leading role of the party raykom and the strength of party influence on the course and results of production will grow even more, but most importantly the party committee will receive an opportunity not to be diverted by hundreds of routine production questions and can pay more attention to the long-range social problems and to ideological and organizational work in the labor collectives.

Of course, since in Estonia the rayon agroindustrial complexes are being organized for the first time, a portion of the important questions is awaiting its solution by the Union bodies. Thus, the republic level of the agroindustrial complex has not been formed in organizational and economic terms while the republic bodies do not have the rights and economic levers for intersectorial maneuvering in the aim of bringing up the lagging elements. In a word, the

strength of inertia is great and the departmental barriers as yet have not been knocked down. This question is not simple, but it is imperative.

At the May (1982) Plenum of the CPSU Central Committee, Comrade L. I. Brezhnev emphasized: "Our cadres in the countryside have grown immeasurably and they are capable of carrying out great and complex tasks. Confidence in the leaders, a demanding and concerned approach to their activities, the encouraging of initiative and at the same time a rise in personal responsibility for the assigned job--this is the essence of party policy on this question."<sup>2</sup>

This applies completely and fully to Estonia as well, where merely due to improving the quality of work carried out by the agricultural personnel it is possible to achieve an increase in production volume. In the republic there is simply no other way, since the situation with labor resources in our republic is very taut and during the current five-year plan, their increase, in comparison with the Tenth, will decline significantly. Even by the start of the 1970's, the percentage of persons employed in Estonian agriculture was almost 2-fold less than as a whole for the nation. The countryside lacks equipment operators and milkmaids while a significant portion of the available personnel does not meet the high demands made in working on mechanized farms and complexes.

At present, the migration from the countryside to the city is continuing. People at times leave even well-built houses in the countryside and go to the rayon center, to the town, where there are greater opportunities to select a profession to one's liking and leisure has been better organized for the youth. Thus, the ties are broken between agriculture and the rural youth. In order to prevent its migration from the countryside, there must be a different approach to the location of the productive forces and the agroindustrial complex must be saturated with everything needed in working on the farm and tilling the land. This opens up new opportunities for selecting a profession and for improving working and living conditions in the countryside.

The following fact is reason for great reflection. While over the last decade the number of rural workers as a whole declined somewhat, on the sovkhozes over this same period it rose while it declined significantly on the kolkhozes. At present, agriculture needs for every 1,000 workers 350 skilled workers trained in vocational-technical schools, and by 1990, the demand for them will increase up to 396 persons.

Over the last 10 years, 11,800 skilled workers have been trained for the countryside in the system of state vocational-technical schools. However, their rate of retention on the job is very low. Thus, in 1968, out of the number of young workers arriving from the vocational-technical schools, 68 percent left. The problem is further complicated by the fact that the existing network of regular schools cannot admit all the rural youth entering working age. Each year, out of the number of persons reaching working age in the rural localities, only one-half has an opportunity to receive agricultural

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<sup>2</sup> KOMMUNIST, No 9, 1982, p 12.

professions. The remainder are forced to migrate to the city, if measures are not taken to attract them to the kolkhozes and sovkhoses with subsequent vocational training. For this, it is essential to set up a good educational plant. In 1981, under the Estonian Minsel'khoz [Ministry of Agriculture], a training center was opened with affiliates in each rayon agroindustrial association. This should significantly solve the given problem.

During the last five-year plan, the republic kolkhozes and sovkhoses as an annual average trained 4,800 skilled workers and 4,700 persons increased their skills in courses. It has been established that the labor productivity in tractor operators of class I is 24 percent higher than the tractor drivers of class II and 60 percent higher than for class III. Hence, by improving the vocational skills of the agricultural workers, it is possible to bring about a substantial increase in labor productivity. This is extremely important at present and over the long run. However, on this question there still are many serious shortcomings. Thus, during the Tenth Five-Year Plan, the periodicity for improving the skills of agricultural workers was 17 years instead of the required 5-6 years. In keeping with this lag, for the 11th Five-Year Plan the Estonian Minsel'khoz was given the assignment of improving the worker skills by 2-fold more than was achieved in the previous 5 years and for the workers and specialists by 3.8-fold.

The solving of personnel problems requires a scientifically sound approach on matters large and small and separately for the kolkhozes and sovkhoses. The recruitment and retaining of personnel in the countryside depend largely upon the attention shown by the farm leaders to the questions of material and moral incentives, the scientific organization of labor and management. For example, positive results have come from specializing the kolkhozes and sovkhoses and introducing on them optimum standard jobs for the leading specialties. This has disclosed additional reserves for raising labor productivity. Due to the carrying out of an entire range of measures in dairy livestock raising in 1981, calculated per milkmaid, more than 130 tons of milk were produced in comparison with 74 in 1980. All the republic's dairy production is concentrated at 260 dairy farms with an average of over 400 head of cows. The specialists have rightly asserted that although now the Estonian farms obtain 3,500-3,600 kg of milk per cow per year, this is far from the limit and the reserves are to be found here in shortcomings in feeding the animals, in the organization of labor on the farms, and in the absence of personnel with the required skills. Thus, on the 9 Maya Kolkhoz in Paydeskiy Rayon, where these questions have been resolved, during the Tenth Five-Year Plan the average annual milk yield per cow was 5,127 kg.

When we speak about increased milk production, the problem in essence goes back to its source, the reproduction of the herd. In actuality, in order to raise a high-producing cow, even when it is a calf it must be well kept and provided with the necessary feed. Here probably one of the most difficult problems is that the manpower shortage has been covered by the use of highly productive equipment for feed production. In Estonia, the self-propelled Ye-280 and Ye-301 machines have proven effective. Their number corresponds to the scientifically set norms, but due to the lack of spare parts and particularly because of the irrational use and shortcomings in the organization of labor, the effect established in them by the designers has been significantly reduced.



The Food Program approved by the May (1982) Plenum of the CPSU Central Committee has emphasized the necessity "of ensuring a transition everywhere to intensive methods of livestock raising and a significant rise in the productivity of all types of livestock and poultry...." At present, Estonia has achieved rather high efficiency in pig fattening and in the republic this is carried out by 55 large pig complexes which each year produce more than 500 tons of pork. Poultry production has been concentrated on 17 specialized farms and as a result of this they virtually fully produce eggs for the market and 91 percent of the poultry meat.

The leading Estonian enterprise in egg production is the Order of the Red Banner Tallinn Support-Demonstration Poultry Farm imeni 60-Letiye Oktyabr'skoy Revolyutsii. Here the production volume is 126 million eggs and 1,500 tons of poultry meat a year; the incubator capacity is 5 million chicks. The farm has its own slaughtering shop and a shop for processing waste products. Here 250 tons of meat and bonemeal are prepared for other livestock sectors a year as well as 3,000 tons of protein-rich feed for cattle kept for fattening. There is also a shop producing 2,000 tons of powdered eggs and this product is obtained from the small and cracked eggs. This is used for the needs of the food industry.

Year-round the farm keeps an average of 1 million birds. Here they have converted completely to keeping the chickens in cages and this has made it possible to increase labor productivity by several fold. One person now tends 10,000-14,000 purebred birds, more than 20,000 layers and 29,000 young birds. In 1980, 264 eggs were obtained from each layer, feed consumption for the production of 10 eggs was 1.68 feed units, 1.4 man-hours was spent per 1,000 eggs and costs were 40.49 rubles. At present, the task is to introduce the progressive methods employed on this leading poultry farm on all the farms engaged in poultry raising. This will make it possible to substantially save manpower and feed as well as reduce product costs.

As was already said above, the March (1965) Plenum of the CPSU Central Committee provided a second breath of NOT [scientific organization of labor] in Estonian agriculture. Thus, from 1966, a majority of the republic's farms began to work out plans for all areas of NOT. This work is coordinated by the NOT Council of the Estonian Minsel'khoz. Training for specialists and for a part of the workers from the leading professions has been organized for these questions in all the republic's rayons.

The studying of the NOT problems and primarily advanced experience has been entrusted to two scientific research institutes in this sector and to a norm-research station. The republic has set up three base farms for NOT and these are engaged in testing out advanced experience, after which a decision is to be taken on disseminating it in the republic farms or to do additional work and make additional studies. The NOT plans in Estonian agriculture are linked to the plans for material-technical supply and the introduction of new technology and to the carrying out of scientific research.

We should note the experience of one of the base farms in the republic, the Sovkhoz imeni R. Pyal'son, where the honored rationalizer of the republic V. Lekhtla has worked for three decades as the director. Under his leadership

the farm has become a support-demonstration one for the scientific organization of production, labor and management. Here high efficiency has been achieved from the introduction of NOT measures: labor productivity per worker in 1980 was more than 10,500 rubles in comparison with 8,010 rubles in 1975; labor expenditures have declined correspondingly on the production of agricultural products, for example, at present 8 man-hours are required per quintal of pork weight increase while in 1975 it was 11.4 man-hours.

The sovkhos has acquired interesting experience in organizing narrow specialized mobile groups (brigades, teams) in the two large territorial divisions. This has made it possible to increase the efficiency of production management as a whole and to form specialized field divisions for grain, row and feed crops as well as for seed raising. In accord with the production plans, a whole season ahead, in January, during the repairing of the equipment, they plan the distribution and shifting of equipment operators from one type of work to another and the mechanized detachments are made up. They show a particularly careful attitude toward working time at the peak of the field season. The equipment operators and service personnel are transported to the fields and back home by buses and vans. Fueling and preventive maintenance have been organized directly in the field and equipment is driven to the shops as rarely as possible. "Flying" repair teams consisting of three or four men (a mechanic, welder and electrician) perform minor repairs on the equipment in the field, and radio communications is widely used.

In the peak period, the equipment operators are paid for five shifts a week according to the usual rate and for everything done above this they receive 1.5-fold more. In addition, those who fulfill and overfulfill the daily quotas at the end of the work period receive from 30 to 100 rubles in addition. Material incentives are also provided for high-quality tilling of the soil and harvesting without losses. As a result, a good deal of work time is saved for the equipment operators who are in short supply in Estonia.

As a whole for the republic, the group method is employed in harvesting by 50 percent of the persons employed in crop raising, 75 percent in preparing feed and 20 percent in other agricultural jobs. These figures show that the Ipatovo experiment has taken strong root in our republic and this has been greatly aided by the careful selection of the work groups. With the creation of the specialized production and mobile work groups, the permanent production-territorial brigades have lost their importance. For decades these were the basic form of organizing labor in field work. Thus, a new, more efficient method has been found for organizing labor and management; it has become possible to constantly employ the conveyor method for field work.

The experience acquired on the Sovkhos imeni R. Pyal'son was reviewed at a joint session of the Estonian Goskomtrud [State Committee for Labor and Social Problems] and the republic Minsel'khos. The atoped decree contains a plan of specific measures the implementation of which will result in a noticeable improvement in the attitude of all ranks of leaders to the introduction of NOT and labor norming in agriculture. First of all, order is to be established in reporting. Thus, while in 1977, some 27 percent of the sovkhoses submitted statistical reporting on NOT, in 1981 the figure already was 92 percent. On all levels, an analysis is regularly made of the state of affairs in improving the organization of labor on a scientific basis.



In 1981, in Estonian agriculture, NOT measures encompassed 36.8 percent of the workers, an annual economic effect of 1.5 million rubles was achieved and 903 persons were conditionally released. The plan of the Estonian Minsel'khoz for the current five-year plan envisages a further rise in the amount of work in the given area. Out of the total number of kolkhoz members, the specialized brigades involved in harvesting will include 68 percent at the start of the 11th Five-Year Plan and 72 percent at the end, 41 and 46 percent for the preparation of hay, respectively, and 31 and 35 percent for plowing and the applying of fertilizers. The intersectorial and sectorial standards and norms for labor norming of the workers at the start of the 5-year period should be introduced for 56 percent of the total number of workers and 64 percent at the end; progressive labor and recreation conditions in livestock raising should be found, respectively, for 58 and 91 percent.

As is known, intelligently organized cost accounting is one of the basic NOT requirements in setting up the integrated brigades. We would like to mention the experience of two such collectives operating on a contract. At the Valga Sovkhoz in Valgaskiy Rayon, a brigade has been organized which includes workers from the farm, equipment operators and a group of potato raisers. The basic means of production, land, has been assigned to them. In accord with the farming procedures, the amounts of work and the time required for them have been set. Considering these data, the required number of equipment operators has been established. The brigade includes a contract with the farm, and this gives its rights and duties, on the one hand, and those of the sovkhoz on the other. The contract is in effect for several years and the product plan is not changed until the contract lapses. This encourages the workers to increase their results. For encouraging their personal interests, the crop obtained above the plan is divided by the farm in halves with 50 percent going to the sovkhoz and 50 percent to the brigade members. It can take payment in kind or sell the received potatoes to the farm at 10 kopecks per kilogram.

An integrated brigade which organizationally as well as by material incentives brings together the livestock raisers and feed makers works on the Priypalu division of this sovkhoz. The farm has room for 200 animals. The planned productivity is 3,650 kg of milk per cow with a total production volume of 657 tons, 612 tons to be sold to the state, while 180 calves must be received over the year. If the brigade fulfills the quota by 100 percent and sells up to 90 percent of the planned volume of milk as first grade, with the planned income and expenditures it will receive the ordinary payment and in reducing expenditures it will be paid 100 percent of the saved funds. Moreover, in addition it receives a payment from 50 percent of the above-plan product. The equipment operators who prepare feed for the farm also receive their share considering the end result. Thus, the earnings of the feed makers are directly dependent upon the end product. For this reason the equipment operators are interested in the quality of the feed, its prompt delivery without losses, the better tending of the pastures, the reduction of losses in harvesting and so forth.

Each year, life poses new complex tasks related to the shortage of skilled workers in the countryside, and particularly milkmaids. Thus, in the Tenth Five-Year Plan the number of head of cows on the Estonian farms rose by 9.4 percent while the number of milkmaids declined by 16 percent. It was necessary to fundamentally change the organization of their labor on the farms, in

introducing narrow specialization. This ensures the tending of large groups of cows. As an average for the republic, one milkmaid tends 50 cows. Some 60 percent of the livestock raisers work under two-shift conditions or with a two-cycle workday. Even two five-year plans ago, we worked out a new system for keeping the milking herd. A comparison of the various methods for tending the animals and the organization of labor, an analysis of the results of the division of labor and working conditions showed that milk can be produced most economically and with the least labor expenditures on large farms where the milking herd is kept year-round in the cow barn, in pens for feeding and rest while milking is done at milking platforms.

The farm of the Laarte Sovkhoz in Valgaskiy Rayon has been operating under these conditions for 8 years now. Over this time total milk production has increased from 1,002 to 4,595 tons while less than 2 man-hours is spent to produce a quintal of milk (as the republic average the figure is 3.1). Work is organized on two shifts and is based on a clear division of labor. This provides an opportunity for the personnel to specialize in their job as well as have a workday of normal length, without any breaks. The milkmaids have four morning and four evening shifts and two days off. The brigade leaders, the drivers and the tenders of the young animals have four days at work and two days off. For the remaining workers there are six workdays and two days off.

The scientific co-workers from the Estonian Scientific Research Institute for Livestock Raising and Veterinary Sciences, Doctor of Biological Sciences E. Val'dmann and Candidate of Economic Sciences V. Pil'v, have conducted special research on the organization of labor at the large farms with milking platforms. They have positively viewed this method and have provided useful recommendations to the actual workers. Thus, the joint activities of the scientists and farm specialists in the area of NOT have made it possible to significantly weaken the tension in the milkmaid profession which is one of the leading ones in livestock raising.

As is known, for any sector the core and heart of NOT are labor norming. The level of this work to a significant degree depends upon how it is organized. In our republic labor norming in agriculture is under the leadership of the norming station of the Estonian Minsel'khoz. This station includes four specialized sections (labor norming in crop raising and analogous ones for livestock raising, stationary machines and subsidiary enterprises, for energy and the fuel system). Technically sound norms have been worked out by the station for a majority of the agricultural jobs. On the farms labor is normed on the basis of the manual compiled by its specialists and approved by the Estonian Minsel'khoz and the Estonian Republic Committee for the Trade Union of Agricultural and Procurement Employees. Each year, the station holds "republic training days" for the farm economists following a special program.

It has become a rule that in the sovkhoz collective contracts, reciprocal obligations are assumed by the administration and the collective to improve the level of norming and to create conditions for fulfilling the technically sound standards. The periodic inventorying of the fields and livestock farms has become an important element in their elaboration. This was done for the first time in 1964-1965. Starting in 1975, the production and financial plan of the farms must include without fail a section for the "calendar plan for the revising of output standards."

In carrying out the decree of the USSR Goskomtrud, the republic Goskomtrud has constantly monitored the state of labor norming on the farms and has provided them with help. Thus, at recent committee sessions they have examined questions of key significance, including: "on the situation with labor norming in livestock raising and on the fulfillment of the output standards on the kolkhozes and sovkhoses," and "on the state of labor norming for the tractor operators of the republic kolkhozes and sovkhoses and their fulfillment of the output standards." Increased tautness of the standards and the saving of labor resources in the countryside are achieved primarily as a result of introducing new equipment and the better organization of labor. For example, in Vil'yandiskiy Rayon, the number of milkmaids in 1975-1980, was reduced from 900 to 126 due to these factors.

As a whole, an analysis of the state of affairs in the area of labor norming in the republic agriculture indicates that the work involved in mechanizing field work, transport work as well as the work done by the tractor operators is being normed better and more widely than in livestock raising. The serious shortcomings of labor norming can be seen from the fact that still the growth rates of average wages outstrip the growth rates of labor productivity. In truth, this is particularly apparent during the bad weather years, when the labor intensiveness of a unit of product rises sharply, but it is all the more essential to have better organization and efficiency and an increased level of labor norming. With a shortage of equipment operators, the losses of their working time are still high as can be seen from the photographing of the workday. There are still many other negative phenomena. Undoubtedly, in agriculture labor norming is more complex than in industry, but we should eliminate the shortcomings in this question.

The Food Program for the period up to 1990 has outlined specific quotas for the production of agricultural products. Their realization is a difficult but feasible task. In relying on the enormous aid from the party and the national government and in seeking out and activating the internal reserves, the Estonian rural workers will do everything to carry out the set task.

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## **LABOR**

### **TECHNOLOGY--KEY TO INCREASED LABOR PRODUCTIVITY**

Moscow EKONOMICHESKAYA GAZETA in Russian No 48, Nov 82 pp 11-14

[Unattributed special section: "Scientific and Technical Progress--The Basis for the Growth of Labor Productivity"]

[Text] During the current academic year, among other subjects the schools of communist labor are to study "Scientific-Technical Progress and the Economy." A standard program for this subject was published in No 35 of EKONOMICHESKAYA GAZETA. A study supplement for the first subject was published in No 43. Below we publish materials on the second subject "Scientific-Technical Progress--The Basis for the Growth of Labor Productivity."

#### **New Technology and Labor Efficiency**

As was pointed out in the preceding subject, scientific and technical progress has a decisive impact upon the growth of labor productivity. The labor productivity level and the rate of its rise are the most important and most general indicators for the development of society's productive forces. The higher labor productivity, the more material goods society receives on a per capita basis and the more favorable the conditions become for the all-round development of people and for the growth of the people's prosperity. "Communism," wrote V. I. Lenin, "is a higher labor productivity, in comparison with capitalism, by voluntary, aware, united workers who employ advanced equipment" ([Complete Collected Works], Vol 39, p 22).

#### **In the Interests of Society and Man**

In speaking about the tasks of raising labor productivity, V. I. Lenin gave primary significance to the technical reequipping of production on the basis of developing heavy industry. "A rise in labor productivity," he wrote in 1918 in his work "The Next Tasks of Soviet Power," "requires, first of all, providing the material base for large-scale industry, that is, the development of the production of fuel, iron, machine building and the chemical industry" (Vol 36, p 188).

The Communist Party, in steadily following Lenin's legacy, has always given and does give primary economic and political significance to scientific and



technical progress. Only under socialist conditions does scientific and technical progress assume a direction meeting the interests of society and man. In turn, only on the basis of accelerated scientific and technical development can labor productivity be increased.

At the November (1982) Plenum of the CPSU Central Committee great attention was given to the questions of introducing the scientific and technical achievements. "We possess great reserves in the national economy...", said the General Secretary of the CPSU Central Committee, Yu. V. Andropov in a speech at the plenum. "These reserves must be sought in the accelerating of scientific and technical progress, in the broad and rapid introduction of the achievements of science, technology and advanced experience into production."

The achieving of the highest labor productivity on the basis of scientific and technical progress has always been, is and will be the central direction for the nation-wide struggle for the greatest possible growth of the efficiency of social production and the acceleration of the nation's economic potential on this basis. While 20 years ago a rise of 1 percent in labor productivity made it possible to increase the volume of industrial product by a little more than 900 million rubles, at present, when scientific and technical progress has immeasurably accelerated and each year 3,600 new models of highly productive machinery, equipment and automation are developed and put into production, each percent of increased labor productivity is now "worth" more than 6 billion rubles.

The main lever for the influence of scientific and technical progress on the growth of labor productivity is the development, production and introduction of labor-saving equipment and production methods. Newly built shops are being equipped with new equipment, obsolete machines are being replaced at operating enterprises and progressive production processes are being introduced. In 1971-1980, in industry 6,131,000 measures were carried out related to new equipment and production methods. The overall economic effect reached 39 billion rubles. As a total due to increasing the technical level of production during the last five-year plan, more than two-thirds of the increase in labor productivity was achieved. A weighty contribution was made by fundamentally new implements of labor, for example, the automatic manipulators.

**Growth of Labor Productivity**  
(in %)

	1965	1970	1975	1981
In industry	100	132	177	212
In construction	100	122	157	178
In agriculture	100	137	146	165

By the start of the 11th Five-Year Plan the nation had in operation 6,000 industrial robots. By 1985, their fleet will reach 100,000 units. The output of manipulators is to increase particularly for full mechanization and automation of stamping, foundry work, galvanic plating, painting and welding, materials



handling and warehousing work. That is, the robots will go to work primarily in sections with heavy and harmful working conditions. They will provide an opportunity to convert 200,000 units of universal equipment to automatic operating conditions and will save the labor of approximately 400,000 workers.

The use of manipulators makes it possible to create fully automated sections which are controlled by computers. Here labor productivity is 4-5-fold higher. For example, at the Kovrov machine plant (Vladimir Oblast), robots service 150 units of basic and auxiliary equipment. The work of the workers employed in this area has been made easier and labor productivity has risen by 3- or 4-fold.

Improving traditional equipment also entails great reserves. The labor intensiveness of foundry work is well known to all. In the 11th Five-Year Plan we intend to manufacture 24,000 automatic and semiautomatic foundry units, and series output is being organized for equipment for pressure casting with programmed control, as well as molding sand slingers and core layers with numerical program control based on microcomputers. Due to this equipment, labor productivity for foundry workers will arise by 1.5-2-fold and heavy manual operations will be significantly reduced.

In metalworking, where universal machine tools still predominate, a policy has been set of introducing automatic lines and machine tools with numerical program control. These are to be organized into fully automated sections controlled from a central computer as well as into "manufacturing centers." According to the estimates of economists, the output planned for this five-year plan in more advanced metalworking equipment will provide a savings equivalent to the labor of 1.3 million workers.

The effect of progressive production methods on the growth of labor productivity is a diverse one. For example, take the methods for stamping work. As is known, before working the metal is heated, scale forms on the piece and this must be removed. This requires a good deal of working time and energy while scarce metal is lost as chips and pickling slag.

However, there is a method for reducing such losses and this is the use of special temporary surfaces. Their use at 50 enterprises of different sectors has shown that the yield of usable metal is increased by 5-25 percent, the life of the dies is increased by 1.5-2-fold and labor productivity is increased by 10-12 percent.

Similar examples for high economic effectiveness of new equipment and production methods can be found in all the national economic sectors.

#### Fully Utilize the New Equipment

No matter how advanced the equipment and production methods are, the effectiveness of their use for increasing labor productivity more and more depends upon the workers and specialists, upon the level of their education, skill and professional mastery. This is explained by the increased scale and complexity of modern production. At present, as an average per worker there are more than

30 hp of energy, and the average value of one work area has reached 15,000 rubles. In order to work successfully on modern equipment, it is essential to have a good knowledge also of the design of the machines, the course of the production process, the requirements of the standards and technical conditions and to constantly improve one's skills.

In our nation, much has been done to carry out these tasks. At present, educated and professionally trained workers are employed in all the national economic sectors and they are capable of successfully carrying out complex production and technical tasks. Just compare: in 1960, for every 10 workers who had completed their vocational training in a PTU [vocational-technical school], the technical schools and VUZes there were 40 workers who did not have such an educational level. But over the last 20 years, this ratio has changed: at present for every 10 persons who received their vocation in special schools there are now only 15 persons who have not undergone such schooling. And a majority of these workers, having mastered their profession directly on the job, have also become skilled practical workers. However, as the special research shows, these workers in terms of their skill, viewpoint and the ability to master modern equipment and production methods, as a rule, are behind those who have received their professional training in the special schools. For this reason it is important to constantly study and improve one's professional skill. All opportunities for this are being created at the enterprises.

The most mass form for improving worker skill on the job are the permanent or temporary schools of advanced experience which teach the progressive labor methods of production innovators. Training, as a rule, is carried out on the job.

The interplant schools for advanced experience in the leading professions have become widespread. In one such school, they are studying the experience of the excavator brigade leader from the Central Mining-Processing Combine (Krivoy Rog), Pavel Gil'. An excellent knowledge of the equipment and mining methods, an innovative search for rational labor methods have helped the Gil' crew to complete the 1981 plan 2.5 months ahead of time and to meet the 1982 quotas by the 65th anniversary of Great October.

What is the "secret" of P. Gil'? It lies in the rationalizing of excavation. According to the standard, the excavating cycle is 32 seconds, but the brigade keeps within 20-22, that is, it achieves a savings of almost 10 seconds of work time per shovel move. This experience has become of interest to the crews in the iron-ore open pit mines of the USSR Minchermet [Ministry of Ferrous Metallurgy]. Exchange schools of advanced experience have arisen. For these schools the USSR Minchermet has prepared a detailed description of the Gil' work procedures and methods. In the large basins and at a number of the mining-processing combines, interplant excavator operator schools are being held. In 1982, 880 excavator and transport brigades were participating in the competition to master the increased labor productivity procedures. The leaders in this competition exceed the average sectorial output by 1.5-2-fold.

It is inconceivable to master the new equipment and production methods and thereby raise labor productivity without a consistent strengthening of labor discipline. The importance of each hour and each minute of working time rises

with the acceleration in scientific and technical progress. Certainly the loss of one working minute on a nation-wide scale is the equivalent of losing the day's labor of 200,000 workers.

[Transposed graph: As an annual average, the modernization of production equipment in industry has risen from 135,000 units in 1966-1970 up to 162,000 units in 1966-1970 up to 162,000 units in 1976-1980.]

The 26th Party Congress pointed to the need of achieving a significant strengthening in labor discipline and improving order and organization on the job.

The importance of further strengthening labor discipline is explained not by the fact that it has become weaker or worse. No. In the 1970's, the working time losses due to absences without leave as an annual average declined by 2.5 percent, while the share of losses due to absences with the permission of the administration declined by almost double. But not all the enterprises and organizations pay daily attention to labor discipline, to improving working conditions and to ensuring high organization on the job.

Experience shows that the existing equipment is most efficiently used and working time losses are minimized in those instances when the introduction of new equipment is accompanied by the establishing of precise organization of the work for those servicing this equipment.

One of the examples is the mining brigade of A. Pilishchuk from the Trudovskaya Mine of the Donetskugol' [Donetsk Coal] Association. Here they have achieved synchronized work in the mining and repair shifts, in the clearing face, underground transport and in lifting. And as everything moves in the pace set by the equipment, production discipline is strong and the capacity of the machines is fully utilized. This has made it possible for the brigade of A. Pilishchuk to bring the average daily load factor per long wall up to 3,000 tons, or as much fuel as is mined at one average-sized mine.

#### The Introduction of New Equipment--A Concern for Each Worker

In all sectors, plans are worked out for introducing new equipment and production methods as well as for the training and retraining of skilled personnel. Without fail they take into account how one or another technical innovation tells on the saving of labor and the growth of labor productivity.

For example, in the machine tool industry during this five-year plan they intend to achieve the entire increase in production at the existing plants without increasing the number of workers. How will this be achieved?

In the first place, by improving the fleet of equipment. At the machine tool and tool plants over the five-year plan, 88 sets of automatic and semiautomatic lines will be introduced along with 7,000 highly productive machine tools. Some 22 automated sections consisting of machine tools with numerical program control are to be created.

The second way is to reduce heavy manual labor in the basic and auxiliary jobs. For this, the sector has worked out and is implementing a specific comprehensive

program. The carrying out of the measures outlined in it will make it possible to conditionally release 58,000-60,000 workers while labor productivity should rise by 12 percent.

The fulfillment of the plans for working out and introducing new equipment and progressive production methods and the achieving on this basis of the highest labor productivity depend largely upon the workers themselves. The forms of their participation in carrying out these plans are diverse and include:

- 1) Invention and rationalization work;
- 2) Reviews and competitions for raising the technical level of production;
- 3) Creative brigades for scientific and technical cooperation;
- 4) A competition for personal plans to increase production efficiency.

The most mass form of worker involvement in carrying out the plans for scientific and technical progress is rationalization work. At present, one out of every two members of the All-Union Society of Inventors and Rationalizers is a worker. Their contribution to the technical reequipping of production has been enormous. In 1981 alone, the nation's inventors and rationalizers submitted 4.9 million proposals, over 4 million of their proposals have been introduced into production, they have helped the collectives improve the existing equipment and to more rapidly introduce and bring new equipment up to the design levels.

One of them is the brigade leader of installation workers at Samotlortruboproduktsion [Samotlor Pipeline Construction Trust], Valeriy Kril'chik, winner of the 1982 State Prize. As is known, the gas lift method of oil production is a new thing in Siberia and still difficult for the installation workers. The rationalization boldness of the brigade leader has lent a hand. His 15 introduced proposals have helped to make serious adjustments into this technology. Labor productivity of the installation workers has risen and the savings has been 21,000 rubles.

Another example is the experience of the assistant foreman of the Mostrikotazhprom [Moscow Knitwear Industry] Association, Hero of Socialist Labor A. Belov. He operates 27 OZCh-14 type automatic knitting machines instead of the 9 according to the standard. The equipment is new and not everything has been worked out in it. No matter how the knitting operators of his brigade tried, each day they were short one-fifth of the daily quota or 700 pairs of hosiery. Then the assistant foreman set out to bring the automatic machines "up to snuff."

The 15 rationalization proposals arose during those 3 months which went to adjust the machines. The economic effect from these proposals was 10,000 rubles. And 12 knitting machine operators began to serve 37 automatic hosiery knitters and this was one-quarter more than the average sectorial standard. The brigade completed the quota for the 2 years of the five-year plan by the 65th anniversary of Great October and from the thread saved on well-adjusted automatic equipment produced an additional 11,000 pairs of women's cotton hosiery.



At many leading enterprises there are well organized systems for the involvement of the workers in improving the technical base of production by creative personal plans.

The Ternopol Vatra Association has gained interesting experience of worker participation in increasing the technical level of production and the products. Here for accelerating the technical and organizational preparation of production for new products, special groups are set up which include specialists from the various plant subdivisions and innovator workers. These work out and organize the manufacturing and introduction of special equipment, production fittings, as well as nonstandard equipment for the mechanization and automation of labor. Even during the production preparations for the new products, these groups work out proposals aimed at achieving minimal metal and labor intensiveness. This makes it possible on a planned basis to increase product effectiveness both in production and in consumption. Here are certain results: in basic production the mechanization level has reached 80 percent and in auxiliary production 64. More than four-fifths of all the products at the association are produced with the state Quality Mark.

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**Introduction of Measures for New Equipment  
and Their Economic Effectiveness**

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	1970	1975	1980
Number of measures introduced for new equipment	423,000	621,000	773,000
Number of conditionally freed workers	399,000	576,000	555,000
Annual economic effect from introduced measures calculated per year, billion rubles	2.6	3.8	4.8

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**The Technical Level of Production and Product Labor Intensiveness**

A reduction in product labor intensiveness makes it possible to most correctly describe the real growth of labor productivity in manufacturing the specific product types and makes it possible to compare the labor results of the workers in the course of their competition. Labor intensiveness is the amount of working time spent to produce a unit of product. It depends upon how productive is the equipment, how high the worker skills, how intensive the production processes and how advanced the organization of labor and production.

The higher the technical and economic parameters of the equipment (for example, speed, finish, the accuracy of machining the part) the more intensely the production processes occur and the higher the level of organization for basic and auxiliary production (the stock is received rhythmically, the worker does not lose time on searching for the stock, the tool or the drawing) and the less time he spends on each piece and the lower its labor intensiveness. According to the estimates of specialists, in the total aggregate of reserves for increasing output, the share of the reduction in labor intensiveness is 70-80 percent.



## Factors in Reducing Labor Intensiveness

What factors most strongly influence the reduction in labor intensiveness per unit of product?

In the first place, the modernization of equipment and a rise in the level of production mechanization and automation.

Secondly, a rise in the technical level of the produced products, that is, the reduction of their weight, the use of progressive materials and viable substitutes.

Thirdly, the improvement and introduction of progressive production processes.

Fourthly, the improved organization of labor and production, the consistent carrying out of NOT [scientific organization of labor] measures, including the improving of labor norming.

Let us examine the effect of these factors on product labor intensiveness from the example of the Taganrog Priboy Plant.

By the start of the Tenth Five-Year Plan, at this plant over 50 percent of the workers in basic production and 70 percent of those employed in auxiliary jobs worked manually, without the aid of machinery and equipment. They produced a broad range of complex products in small series. Moreover the small assembly areas were scattered over various shops and this did not make it possible to employ productive equipment and fittings there.

It was decided first of all to organize specialized complete-product sections and set up at them the flow-operation production of the products which most held up production. In particular, all the assembly areas for braided cable products were combined into one shop, specialized equipment was designed and manufactured at the plant for this and the servicing of the work areas was improved. Due to these measures alone, labor productivity was immediately increased by 30 percent and in individual operations by 50 percent. When the obsolete metalworking equipment was replaced by machines with numerical program control [NPC], the labor intensiveness of manufacturing the pieces was reduced by 60,000 norm-hours. This was the equivalent of saving the labor of 24 machine tool operators.

At present, the plant intends to introduce another 18 machine tools with NPC, 13 industrial robots and 80 units of productive equipment as well as organize a fully mechanized shop. These measures will further lower product labor intensiveness. According to the plan they intend to save the labor of 680 workers.

The improving of production methods and particularly the standardizing of pieces and assemblies has also been of serious help. This has made it possible to increase the series run of product output and hence reduce labor expenditures per unit. The plant has worked out a system for eliminating the diversity in part and assembly sizes. Over the 5 years, the plant's shops and sections have made around 2,000 standardization proposals. Over 3,000 part sizes have been taken out of production. Calculated per product, labor intensiveness has been reduced by 22,000 norm-hours.

[Transposed table: The energy-to-labor ratio in industry has grown as follows (1965 = 1): 1.3 in 1970, 1.7 in 1976 and 1.9 in 1981.]

The plant has also paid attention to auxiliary production. For example, a fully mechanized warehouse for preassembled products and four mechanized warehouses have been introduced. Here with the same area their capacity has been doubled and the number of warehouse workers reduced.

The technical reequipping of auxiliary production is a particularly important reserve for reducing product labor intensiveness and for increasing labor productivity. At present, the share of manual labor in auxiliary production in industry reaches 70 percent. Here unnormed work prevails along with output rates that are most often experimental-statistical, with low tautness.

It has been estimated that the expenditures on mechanizing auxiliary production are approximately 3-fold more effective than the expenditures on mechanizing the labor of basic workers. Merely due to better organization, the rationalization and introduction of mechanized tools in transport and warehouse jobs (and one out of every three auxiliary workers is employed in them), here labor productivity could be increased by approximately 30 percent.

It is also essential to bear in mind the great reserves for increasing the productivity of labor for persons engaged in repairs.

At Glavtyumen'neftegaz [Main Tyumen Oil and Gas Administration], the name of the foreman of underground well repairs, Vladimir Ivanovich Lorgin, the winner of the 1982 USSR State Prize, is well known. And primarily for his enterprising proposals which are deceptively simple. For example, how to mount basic repair equipment on a cross-country vehicle or manufacture sled-type quickly assembled gangways. But the carrying out of these proposals has made it possible for the brigade to save 15 percent of the working time.

Another proposal has been to employ a universal mechanical wrench. Due to this the brigade has avoided manual labor here. It has become the first in the association to work under a continuous three-shift schedule. The new work conditions have provided an opportunity to reduce the number of idled well. Merely due to this it has been possible each year to produce an additional 2,000 tons of oil.

#### The Scientific Organization of Labor

However, it is not enough to saturate production with new equipment. It is also essential to organize its skillful operation. And for this we have an effective means, the scientific organization of labor (NOT).

The development and introduction of NOT measures are based upon scientific and technical achievements. Their carrying out presupposes a systematic rise in worker skills, the greatest possible strengthening of labor discipline and the improving of material and moral incentives.

During the 11th Five-Year Plan we intend to improve the organization of labor in all levels of production and management. According to the estimates of

specialists, due to the NOT measures it would be possible to reduce the demand for manpower in the national economy by approximately 3.7-4 million persons.

The level of labor productivity also depends under what conditions a person works. It has been estimated that an improving in working conditions provides around 6 percent of the total economic effect from introducing the NOT measures in industry. Due to this factor alone, in 1980, the labor of almost 400,000 persons was saved. Our nation has done a good deal in this direction. A system of norms has been worked out and their observance guarantees good working conditions. These include hygienic lighting, the maximum acceptable level of noise, dustiness and humidity, labor safety and an optimum system of nourishment and rest.

But the greatest effect comes from improving labor norming and wages. As a whole for industry, these measures provide up to one-quarter of the economic effect from the introduction of NOT measures. For this reason, the task has been set of improving labor norming primarily through the broader introduction of technically based output norms and operating standards, particularly in auxiliary and time jobs.

The effectiveness of introducing progressive standards is enormous. It has been estimated that due to them each year industry reduces the labor intensive-ness of the products by 1.2-1.3 percent and lowers the need for workers by 120,000-130,000 persons.

In our industry, there are many enterprises where virtually all the workers are employed under technically sound standards. In particular, good experience has been acquired at the Volga Motor Vehicle Plant, the Kiev Tochelektropribor [Precision Electrical Instrument] Association and the Kurovskoye Worsted Cloth Association in the Greater Moscow Area. But at many enterprises the standards are frequently overfulfilled and labor productivity rises slowly. For example, at the enterprises of the USSR Minenergo [Ministry of Power and Electrification], output over the year has risen by 0.6 percent although the standards are exceeded by an average of 41 percent. This shows that here there are no firm guidelines, that the output rates are understated and imperfect and this does not impel them to fight for the highest labor productivity.

In order that the output rate always be progressive, that it provides an incentive, disciplines and requires increased skill and professional mastery, it should be taut, but also technically sound. At the leading enterprises this is achieved by a periodic revising of the obsolete standards and by their on-going adjustment considering the introduction of progressive equipment and production methods, rationalization and increased skills. Time studies are made systematically, while the results of the innovators, the "middlers" and laggards are compared. And there is something to compare. A predominant majority of the piece workers fulfill the quotas by 120-130 percent and are 20-30 points behind the pacesetters. A portion of the workers, particularly the young, at times are up to 100 percent behind. For this reason, in "tightening" the standards of the pacesetters, in bringing the "middlers" up to their level and in helping the laggards improve their skills, the advanced enterprises achieve a systematic decline in product labor intensiveness.

Certainly the revising of the standards should be based upon a range of technical and organizational measures and the introduction of new machines and equipment.

The initiative of the workers themselves plays an important role in the improving of norming. An example of this is the many years' experience of the Aksay Plastics Plant, where they have a system of material and moral incentives for revising the labor quotas at the initiative of the workers. Over the time this system has been in effect, all the piece workers more than three times have revised their quotas. The labor expenditures have been reduced by 615,000 norm-hours. Here labor productivity grows by an average of 14 percent a year, and this is twice as fast as in the sector. Since 1968, the wages of the piece workers have trebled.

**The Mechanizing of Individual Jobs in Construction**  
(volume of mechanized work in percent of total volume of work)

	1970	1975	1981
Earthmoving	98.9	99.3	99.6
Loading and unloading stone, sand, gravel, crushed rock and slag	96.7	98.2	98.9
Loading and unloading lumber, metal, concrete and reinforced structural elements	97.1	97.9	98.7
Loading and unloading cement	76.8	87.2	92.5
Plastering	67.2	71.1	76.6
Painting	72.3	75.6	78.4

Product labor intensiveness is reduced upon worker initiative primarily from introducing new equipment and progressive production methods, from the better organizing of the work area and its servicing. The enterprises carefully make certain that the acceptable level of worker fatigue is not exceeded and that their health is not harmed. Socialist production rationalization differs fundamentally from capitalist. As was pointed out by V. I. Lenin in his article "A 'Scientific' System for Squeezing Out Sweat," "technical and scientific progress in a capitalist society means progress in the art of squeezing out sweat.... The worker initially receives a raise. But hundreds of workers are cleared out. The person who remains works four times as intensely, overstraining himself on the job. All the workers' strength is squeezed out and he is thrown out" (Vol 23, p 19).

The personal and brigade plans for the growth of labor productivity have become an effective means in the fight for increased production efficiency.

The personal and brigade plans for the growth of labor productivity encourage each worker to improve his skills and perform the work of a higher category. These link the brigade's output indicators with the achievements of the section, the shop and the entire plant and make it possible to involve the entire collective in the search for reserves to save working time even in the stage of



elaborating the plan. They serve as a good basis for working out the enterprise counterplans for the early fulfillment of the quotas of the year and the five-year plan for the increase in labor productivity and the socialist obligations of the collectives to fulfill the state quotas without using additional manpower. Precisely on this basis a competition is organized for the daily fulfillment and overfulfillment of the personal shift quotas on the level of designed equipment capacity at the Volgograd Tractor Association.

### **Advanced Experience in the Mechanizing of Labor and the Raising of Labor Productivity**

The struggle for the highest labor productivity should be reinforced by a planned mass technical creativity of the workers and engineers and by the pooling of scientific and practical efforts aimed at achieving specific goals. During the 11th Five-Year Plan, the task has been set of introducing in every possible way full mechanization and automation of the production processes and of constantly reducing in all sectors the number of workers engaged in manual labor, particularly in auxiliary and subsidiary jobs.

### **The Effect of the Mechanization of Labor**

Mechanizing the labor of the workers and freeing them from physically heavy operations at present is one of the primary areas in the struggle for the rational utilization of the labor force and for increasing labor productivity. Here much has already been done in this area during the years of the Tenth Five-Year Plan.

By 1985, the level of mechanizing loading and warehousing operations should rise up to 82-85 percent. Approximately 2 million persons will be freed from these heavy jobs. Entire systems of machines and mechanisms which save the labor of auxiliary workers will go into use.

At each enterprise there are a number of opportunities to accelerate this process and to reduce the proportional amount of the most labor intensive operations.

Many people are familiar with the products of the Moscow Voskhod Mill, but few know under what conditions these were manufactured. There was old equipment and manual labor. Now, when you pick up a school notebook, a notepad or an ordinary office file these are products from the Moscow Voskhod Scientific-Production Association. And it is not merely a question of changing the name, but rather changes in the organization of production and labor which have been made by full mechanization and automation. Modern highly productive machines have helped to sharply raise output. The economists have estimated that if the technical level of production would have remained as before, to produce today's product volume it would have taken more than 10,000 persons, but now 3,300 are employed here.

Of course, the new equipment has been received from specialized machine building enterprises. But the local rationalizers have not been left out. For example, the introduction of a series of rationalization proposals by innovators from the third shop of factory No 3 provided an opportunity to increase product output by almost 20 percent.



[Transposed table: The equipment-to-labor ratio in construction has grown as follows (1965 = 1): 1.7 in 1970, 2.7 in 1975 and 3.8 in 1981.]

As the calculations of specialists show, in the national economy there is the potential to mechanize the labor of 20-25 million persons. A list of jobs has been worked out which should be converted first to the category of mechanized. These are approximately 5 million industrial workers. During the 11th Five-Year Plan, for the first time plan quotas for reducing the use of manual labor were set for each industrial ministry and enterprise. As a total over the 5 years, 1.2 million persons should be freed from it.

This task is to be carried out by full production mechanization and automation. Of course, our state will make the basic contribution. The central planning bodies have worked out a specific comprehensive program to reduce the volume and share of manual labor and the necessary funds are to be allocated for carrying this out in the nation's economic and social development plans.

The regional programs are also making a major contribution to solving the problem. These have been worked out and are being implemented in Moscow, in the Ukraine, Lithuania and Latvia, in the other Union republics, krais and oblasts and large industrial centers.

#### The Development of the Initiative of the Zaporozhye Workers

However, as practice has shown, the achieving of the program goals can be significantly accelerated with the aid of a well organized socialist competition. This has been widely developed in the nation under the motto "Manual Labor on the Shoulders of Machines."

This movement has been most clearly organized at the industrial enterprises of Zaporozhye Oblast where during the years of the Tenth Five-Year Plan an ordered system was developed for a competition to reduce manual labor. Largely due to it in Zaporozhye industry in just 2 years the lowest employment level in the Ukraine in unmechanized jobs was achieved and here labor productivity has risen much more rapidly than the republic average. This is proof of the high effectiveness of the competition.

The achieving of the complete freeing of workers from heavy, unskilled labor and an actual savings of labor have been set at the center of attention for the competitors. For example, at the Kommunar Motor Vehicle Plant, there was the labor-intensive operation of polishing a car bumper. This employed 13 workers. In the course of the competition, the plant innovators conceived a special automatic device and all the polishers, after retraining, became skilled lathe operators, machinists and welders.

At the leading enterprises, before commencing mechanization, a profound analysis is made of the specific work areas where this is required. First of all they ascertain all the manual operations, they assess the degree of their hardship and accounting cards are drawn up on this basis. Using these they determine the sequence, economic advisability and technical possibility of mechanizing these operations. Those which have been selected are included in the five-year

and annual plans for the enterprise's social development. Control over the fulfillment of the approved plans and the adopted obligations is basically provided by the social organizations.

The main merit of such a system is the development of worker technical creativity. At the enterprises, within the competition for accelerating the mechanizing of manual labor, contests of rationalizers and inventors are held for the best personal creative plan. Schedules for specialist consultations have been introduced at the consultation points for the mechanizing of manual jobs. A worker from any sector can come here with his proposals and receive skilled aid. Certain enterprises have introduced a procedure where the proposals of the workers and specialists are reviewed in a strictly set time and the results are announced in the collectives where they are employed.

Of course, the scientific research collectives also solve major problems involved in the mechanizing of manual labor. But at any enterprise there are even more particular questions which concern individual work areas and sections. Here the creative brigades provide enormous help. One of them at the Melitopol Motor Plant solved such a seemingly simple question as the mechanized cleaning of gear burrs. This operation was done manually by 12 workers.

Eleven workers were freed from this job while the 12th became the operator of a new machine. His labor productivity rose by more than 10-fold. Another creative brigade at the same plant developed a series of technical innovations for foundry work. It succeeded in completely eliminating the work areas of the mold breaker and the cupola worker and to basically ease the labor of the sand mixers, molders and casters as they became equipment operators.

The most important thing for the development of initiative and creativity is that at many Zaporozhye plants they have introduced a system for the effective summing up of the results of the competition for the labor collectives while all its criteria are directly dependent upon the achievements in the mechanizing and automating of labor.

At the Zaporozhtransformator [Zaporozhye Transformer] Production Association, the results of the competition are summed up daily with the indication of who is ahead and who is behind. Here the fulfillment of the plans for the mechanizing and easing of labor as well as organizational-technical measures is included in the competitions of the review-contests for the best shop (section) of the association in reducing manual labor. This is assessed by separate, weightier indicators. In addition, the introduced rationalization proposals are considered to eliminate heavy manual labor as well as the economic effectiveness of realizing personal creative plans. The easing of female labor is encouraged separately as the number of evaluation points is doubled.

The results of the competition and review contests are summed up once a quarter and for nine understandable and comparable indicators. The winners are awarded pennants and monetary prizes. These are received only by those workers who have directly made a personal contribution to eliminating heavy and unskilled labor.

## The Plan Quota with Fewer Workers

A reduction in the share of manual labor and its greatest possible mechanization create a material basis for further developing the initiative of the Sverdlovsk construction workers "The 5-Year Quota with Fewer Workers!" and the initiative approved by the CPSU Central Committee of the workers in Yaroslavl Oblast who have resolved in the 11th Five-Year Plan to achieve the entire increase in industrial production without increasing the number of workers. At present, this initiative has become widespread in industry, construction and transportation. A good deal of experience has been gained. How is an increase in product output achieved with the same or smaller number of workers?

In the first place, by the comprehensive technical reequipping of production. Its prime goal is to sharply reduce manual labor so that the freed workers could be sent to new production areas, shops, plants and factories.

Secondly, by improving the organization of production, bettering the working and living conditions of the workers so as to reduce and eliminate unjustified personnel turnover and the related working time losses.

Thirdly, by strengthening labor discipline and eliminating absences without leave and unjustified leaves with the permission of the administration.

The achieving of these goals has been organized on a planned basis. For example, in Yaroslavl Oblast, at the 142 largest associations and enterprises which produce more than four-fifths of the industrial product, for the 11th Five-Year Plan comprehensive plans have been worked out for technical, organizational, social and indoctrinational measures aimed at increasing labor productivity at each work area.

Interesting experience has also been acquired in other sectors. For example, the collective of the Moscow Marshalling Depot has come out with the initiative to accelerate freight shipments by increasing the weight and length of the trains. The introduction of a new method for making up and pulling the trains, the increasing of locomotive power and more advanced automation and telemechanics were an important source for additional capacity. Now the same crews operate trains the average weight of which has been significantly increased.

Instructive experience has also been acquired by the enterprises in the textile and light industries of Ivanovo Oblast. Due to measures related to technical reequipping and reconstruction, these have increased the production volume with a smaller number of employees.

In accord with the program worked out for the 1970's, technical reequipping has been carried out here in the following basic areas: the replacing of the fleet of machinery and machine tools; broadening the production areas and increasing the capacity of auxiliary production; modernizing operating equipment; the use of new production processes which reduce production stages, lower the expenditures of live labor and improve product quality. Great attention has been given to improving the labor and everyday life of the workers and to environmental protection. In the course of the reconstruction, automated production lines

have been organized simultaneously with the replacing of equipment and the building of additions and superstructures in the existing buildings.

Due to technical reequipping, reconstruction and modernizing of the enterprises, the production volume has increased by 23.2 percent, labor productivity has risen by 40.2 percent while the number of workers has declined by 27,400 persons. This work was awarded the 1981 USSR State Prize.

#### The Shchekino Method

The well-known Shchekino Method holds a special place in the advanced experience of struggling for the highest labor productivity. As a matter of fact, this was one of the first attempts to achieve an enterprising combining of professions on the basis of the broad introduction of scientific and technical achievements and moral incentives into production in order that the entire increase in product was achieved with a smaller number of workers.

During the years of the experiment (1967-1981), the product volume at the Shchekino Azot [Nitrogen] Association (the initiator of this method) increased by 3.1-fold, labor productivity rose by 4.1-fold while the number of industrial-production personnel declined by 1,814 persons. The savings in the wage fund was 16 million rubles. Over this time, average wages of one employee increased by 66.7 percent. According to the operating results of 1981, the association received the Challenge Red Banner of the CPSU Central Committee, the USSR Council of Ministers, the AUCCTU and the Komsomol Central Committee.

The main reserve for reducing the number of workers is to lower the number of jobs by continuously increasing the technical level of production, by its reconstruction and modernization, by introducing labor-saving equipment, by automating labor-intensive processes and improving the organization of labor.

For example, at the Novomoskovskbytkhim [Novomoskovsk Household Chemical] Production Association, the carrying out of these measures has made it possible to create favorable conditions for the workers to combine professions within the comprehensive brigades. The repairman, V. Pokhal'chuk, became a member of one such brigade of foundrymen. He mastered the profession of foundryman. When the brigade's equipment which he serviced operated normally, the worker took his place at one of the foundry machines. If one of them broke down, he switched to repairing and adjustment and his place was taken by a foundryman from the broken down machine. The experience of V. Pokhal'chuk has been supported in the shop and due to it it was possible to save the labor of four foundrymen.

By the start of the present five-year plan, the various measures to increase labor productivity and the production volume with a fewer number of personnel had been carried out by 9,300 production associations and enterprises employing more than 18 million persons. In just the Tenth Five-Year Plan, as a whole for industry, 968,000 workers were employed or 6 percent of their total number.

The extensive introduction of the Shchekino Method requires the closer coordinating of worker initiative in mastering related professions with the introduction of automatic inspection equipment for the production processes, the convenient placement of equipment and the better organizing of work area servicing.



All of this creates good conditions for carrying out the plan quotas with a fewer number of workers.

#### The Movement of Multimachine Operators

The mass development of the movement of multimachine operators has also helped to carry out the same and even increased program with a smaller number of workers. But, understandably, under the condition that this has been well organized. What is essential for this?

In the first place, the optimum placement of the equipment, its modernization, the introduction of rational production methods and fittings making it possible to machine parts simultaneously on several machine tools and the mechanizing of transport operations.

Secondly, the improving of labor norming for the multimachine operators, the elaboration and use of differentiated piece rates according to the principle of wage advantages for the person who performs the more complex and labor-intensive operations on several machine tools.

Thirdly, the reorganization of the work of the shop services and their focusing on the creation of the best conditions for multimachine operation.

Fourthly, the carrying out of a range of organizational and indoctrinational measures the aim of which is to persuade the machine tool operators of the possibility of operating additional equipment, to teach the workers to control several machine tools and to train them for this professionally.

How in practice are these tasks carried out and what effect do they produce? Let us examine the experience of the Gorkiy Motor Vehicle Plant. Here, in preparing to convert to multimachine operation, more than 30,000 time studies were made and the reasons for the greatest losses of working time were established. It turned out that up to 30 percent of the shift time was spent by the machine tool operators in looking for stock, tools, fittings and various trips. The elimination of these losses also became a program for reorganizing the shop services. The work areas were reequipped for 15,000 persons. Specialists calculated the optimum placement of the equipment and its load factor and they worked out more than 100,000 technically sound standards. A differentiated increase in the piece rates was introduced depending upon the busyness of the machine tool operator, the complexity of the pieces and the number of their output. With the aid from physicians, they determined the fatigue levels of the multimachine operators in order that these did not exceed the tolerable standards.

Such an approach made it possible in a short period of time--in just 3 months--to convert to widened work zones. At present, almost one out of every two machine tool operators at the Gorkiy Motor Vehicle Plant is a multimachine operator. Their labor productivity has risen by 12 percent. The development of multimachine operating and the combining of professions have made it possible for the motor vehicle plant to put an end to the expensive attracting of workers from other cities. They plan to save almost 2 million rubles from this alone.

The enterprises of all the sectors have acquired rich experience in an enterprising and creative solution to one of the most important economic problems, that of ensuring a constant growth of labor productivity on the basis of the broad introduction of scientific and technical achievements into production. This experience is our wealth. To make it available to all means to accelerate technical progress and increase the growth rate of labor productivity.

#### **Targets of the Five-Year Plan**

In the oil industry. In 1985 to bring the proportional amount of oil output at fully automated fields up to 85-90 percent.

In the gas industry. To introduce highly productive automated modular units for preparing the gas at the gas fields.

To build large-diameter gaslines with a high degree of automation and operational reliability.

In the coal industry. To develop coal mining by the most efficient strip mining method at a more rapid rate based on the broad introduction of progressive methods and large-capacity mining and transport equipment.

In ferrous metallurgy. To carry out extensive technical reequipping of the ferrous metallurgy enterprises. To further increase steel production by developing oxygen-converter and electric steel casting methods.

In machine building and metalworking. To substantially increase the production of systems of machines and equipment, automated manipulators with programmed control making it possible to exclude the use of manual unskilled and monotonous labor, particularly in heavy and injurious conditions.

To continue the technical reequipping of agriculture based on new equipment. To complete full production mechanization for sugar beets, raw cotton, long-fiber flax, the applying of organic and mineral fertilizers to the soil and the use of plant protection agents.

To strengthen the physical plant of transport, to accelerate the introduction of new equipment, progressive production methods and automated control systems and to raise the level of full mechanization in loading and repair work.

To carry out measures to significantly reduce the expenditures of manual labor, to equip the construction organizations with highly productive machines, mechanisms and motor transport, including small sized, and to more fully utilize them by increasing the work shift factor.

From the "Basic Directions for the Economic and Social Development of the USSR for 1981-1985 and for the Period Up to 1990"

## LABOR

### ECONOMIST DISCUSSES WAGE, PRODUCTIVITY RATIO

Moscow SOTSIALISTICHESKIY TRUD in Russian No 10, Oct 82 pp 9-19

[Article by Doctor of Economic Sciences, Prof L. Kunel'skiy: "An Important National Economic Proportion"]

[Text] The decisions of the 26th CPSU Congress have pointed to the necessity of ensuring a more rapid rise in labor productivity in comparison with the growth of wages in the national economic sectors, the associations and enterprises. As all the practice of communist construction indicates, the designated lead is essential both for the further development of production as well as for the systematic growth of wages in addition to increasing the payments and benefits from the public consumption funds.

#### I

The more rapid growth rate of labor productivity in comparison with the increase in wages and as a whole real income on a per capita basis is determined by the need to create the necessary conditions for expanded socialist reproduction. However, the degree of this lead depends upon a number of very complex socioeconomic factors which in their aggregate determine the growth rate and basic proportions of national economic development.

The ratio between the growth rate of labor productivity and increased wages on the national economic level depends upon the dynamics of national income and its distribution into the consumption fund and the accumulation fund. But the production of national income itself and its structure in turn depend upon the volume of aggregate social product and at the same time upon how rationally and efficiently the replacement fund is used.

Over the years of the Tenth Five-Year Plan, the total volume of gross social product rose by 1,099 billion rubles, and each percent of its increase meant a rise in product output by an average of 8.6 billion rubles in comparison with 6.4 billion rubles in the Ninth Five-Year Plan and 4.5 billion rubles in the Eighth.

An increased rise in aggregate social product, with other conditions being equal, makes it possible to increase the amount of funds going to satisfy the constantly rising needs of the workers and the members of their families. At the same time, this ensures the reequipping of production on a new technical

base, the accelerating of the rate of scientific and technical progress. This tells directly on increased economic efficiency and the growth of labor productivity. At the same time, the development of production predominantly because of intensive factors, that is, on the basis of the better utilization of fixed productive capital, an increase in the return on investment, the more economic utilization of raw material, fuel and energy resources and reduced expenditures of live labor to produce a unit of product, creates the objective prerequisites for increasing aggregate social product with relatively fewer outlays of live and embodied labor. It must be considered that the share of the compensation fund for the expended means of production in aggregate social product at present is 56 percent in comparison with 52 percent in 1960 and approximately 55 percent in 1970. On the one hand, this is an indicator for the ever-greater rise in the technical reequipping of production, but on the other, proof of the insufficiently decisive turn toward intensive economic management methods.

The national income of society is calculated by subtracting the replacement fund from aggregate social product and for this reason the more effective and rational utilization of this fund makes it possible simultaneously to increase the amount of national income.

From the viewpoint of optimizing the proportions between the increases in labor productivity and wages, it is also important to consider the dynamics not only of the produced national income, but also that used for consumption and accumulation. The differences between them according to the data for 1980 were 8 billion rubles (produced national income was 462 billion rubles while that used for accumulation and consumption was 454 billion rubles). This amount includes the compensation for losses arising in the production process as well as the foreign trade balance, that is, the difference between exports and imports. In the 1970's, produced national income increased by 63 percent and income used for consumption and accumulation by 55 percent.

Since the productivity of social labor is determined proceeding from produced national income while resources on wages depend upon the mass of utilized national income, a reduction in the differences between them both for the absolute amount and in the increase rates correspondingly creates prerequisites for closing the growth rates of average wages and the real per capita income with the increase rates of social labor productivity.

As for the distribution of national income into the consumption fund and the accumulation fund, this proportion largely determines both the possible increases in wages and real income as well as the increase in social labor productivity. Thus, while with an increase in national income the share of the consumption fund also increases in it, with the same increase in the number of workers an opportunity is created to bring the growth rates of wages closer to the increase rate of labor productivity. In turn, an increase in the share of the consumption fund directly depends upon increased effective use of the accumulation fund based on the rapid development of new capital investments, the concentrating of resources on projects being started up and the rapid completion of new projects. Of important significance also is an increased return from the already existing productive capital. Considering that at present the productive capital has been estimated at 1.2 trillion rubles, an increase in



its return by even 0.1 kopeck means a rise in the production volume without any additional expenditures for these purposes by 1.2 billion rubles. In this instance opportunities are created for a relative reduction in the share of the accumulation fund and greater resources going to increase the standard of living. The more rational and economic use of the raw product and material resources contributes to this.

The degree to which the growth rate of labor productivity outstrips wages depends largely upon the structure of social production and the distribution of labor resources between the sectors of the productive and nonproductive sphere.

The closer the growth rates of social production in the first and second subdivisions as well as the increase rates for the output of industrial products of the "A" and "B" groups, the more favorable the prerequisites created for bringing the increase rate of worker income closer to the increase rate of labor productivity.

From the viewpoint of the distribution of existing labor resources over the spheres and sectors of activity, the analyzed ratio is directly influenced by the proportion between the number of persons employed in the productive and nonproductive spheres. Certainly national income, as is known, is created in the production sphere while the wage fund and the other assets being channeled into raising the standard of living of the people are spent both for workers in the productive and nonproductive spheres and the members of their family. Thus, in the total wage fund of employees, the share of persons employed in the nonproductive sphere is 30 percent. For this reason, from the viewpoint of the proportions between the growth of wages and labor productivity, of important significance is the rational and effective use of the labor of the workers not only in the productive and nonproductive sectors, but also, respectively, the more economic expenditure of their wage funds.

If one endeavors to analyze the factors influencing the ratio between the increase in labor productivity and wages not only on the national economic level, but also in terms of the sectors, associations and enterprises, here one must consider the influence of objective circumstances on each of the elements of the designated ratio, that is, on the increase in labor productivity, on the one hand, and the increase in wages, on the other.

From the standpoint of labor productivity, of importance are, primarily, its increase rate, the degree of impact on increasing the volume of produced product or work performed, and the factors influencing the savings of live labor. Thus, the higher the growth rate of labor productivity, the better the prerequisites created for ensuring an optimum increase in the amount of average wages from the viewpoint of the principle of material incentive. This is achieved with a relative reduction in the expenditures on wages for each percentage of increase in labor productivity. It is also essential to consider the constant rise in the importance of each percent of increase in labor productivity as during the years of the Tenth Five-Year Plan each percent of its increase provided an increase in the volume of national income totaling 3.6 billion rubles, and in the 11th Five-Year Plan 4.6 billion rubles.

For the analyzed ratio, it is important to determine the structure of the factors causing an increase in labor productivity. While a rise in labor productivity is related chiefly to scientific and technical progress, to the introduction of new equipment and progressive production methods and to the mechanization and automation of the production processes, an increase in money for employee wages should be relatively less, considering the predominant role of the expenditures of all society in this increase. However, in this instance a rise in average wages should ensure the necessary incentive effect on the development, introduction and most efficient use of the new equipment and production methods. It is also essential to consider that a portion of the effect from utilizing the achievements of scientific and technical progress serves as an important component in the overall resources being channeled into a rise in national well-being.

With other conditions being equal, a relatively larger increase in average wages should occur in those instances when the increase in labor productivity is decisively influenced by the introduction of the scientific organization of labor, the use of tauter standards, the broadening of the service zones for equipment and the combining of professions, a reduction in labor intensiveness, a better use of working time and a strengthening of labor discipline. The problem is that all the listed circumstances are directly tied to the quantity and quality of labor by the workers themselves and, respectively, to the need to encourage them by increasing the amounts of wages.

An increase in labor productivity, particularly in the raw material, fuel and energy sectors, to a definite degree depends upon changes in the mining and geological conditions for extracting the minerals and upon the useful component in them. With a deterioration of these indicators, opportunities for increasing product output and, respectively, labor productivity are restricted. In a number of instances the designated circumstances require an increase in labor expenditures for supplying the national economy with the required fuel, raw products and materials. Under these conditions, there is the particularly urgent task of the greatest possible savings in material resources in all the sectors utilizing these resources. Of course, it is essential to ensure a decline in the labor intensiveness of production and increased efficiency in the equipment used in the extracting sectors.

The analyzed product is also actively influenced by factors which ensure changes in average wages and real income of the public. Along with the dynamic and effective development of the economy, the carrying out of the corresponding social policy has a determining effect upon the increase in average wages and the real income of the public.

Under the conditions of developed socialism, in the decisions of the 24th, 25th and 26th Party Congresses, the policy of a further rise in the well-being of the people was established as a long-range socioeconomic strategy. This necessitates a corresponding increase in real income and its most important component, average wages. Since the importance of each percent of increase in labor productivity is rising for increasing the production of material goods, the weight of each percent of increase in average wages and real income going to worker families is also growing. Thus, at present each percent of increase

in real income creates an opportunity to increase the receipts by worker families (calculated per person) that is 5.8-fold greater than in 1940 and 2-fold greater than in 1965.

The specific amounts of the increase in average wages calculated per percent of increase in labor productivity depend also upon the policy carried out in the tax and price area. Measures to increase the minimum untaxed wage and the reduction in taxes on worker categories that are close in terms of wages create prerequisites for increasing the wage funds actually going into the hands of the employees. At the same time, in keeping with the growth of wages and in considering the progressive tax scale, their total amount, like the share withheld from the wages of the specific workers, to a definite degree is growing although, as is known, taxes take up an insignificant portion of the aggregate income of the workers.

As for prices for the basic food and nonfood products, in accord with the decisions of the 26th CPSU Congress there are plans to further consistently carry out a policy of ensuring their stability. However, this does not exclude the possibility of a certain change in the prices for individual goods considering supply and demand as well as proceeding from the need to form a more rational consumption structure.

In reviewing the proportions between the growth of labor productivity and average wages, one cannot help but take into account the changes in the share of wages in the total amount of real income received by worker families, for the payments and benefits from the public consumption funds are becoming an ever-more important source for satisfying the various spiritual and material needs of the workers and the members of their families. At present, in the calculated total of average wages for employees with the addition of the payments and benefits from the public consumption funds, the latter comprise somewhat more than 27 percent, and considering vacation pay, almost one-third. With an increase in the share of payments and benefits from the public consumption funds, respectively, the expenditures of money on wages calculated for each percentage of increase in labor productivity will relatively decline.

Finally, in determining the specific increase rates for average wages, one must take into account the fact that the organization of wages objectively determines their natural increase in line with the greater skill level of the workers, the increase in the total number of working specialists and the change in the sectorial and regional structure of the employed. Also of important significance is the ensuring of the appropriate rise in wages related to the need to encourage the fulfillment and overfulfillment of the established plan quotas for the production volume and for increasing its efficiency.

In the national economy in the 1970's, the following ratios were established between the increase in labor productivity and the increase in average wages (including considering the payments and benefits from the public consumption funds) and in addition the real per capita income (see the table on following page).

The given data show a definite trend for bringing the indicators for increased income of the population closer to the growth rates of labor productivity. If

one adds the public consumption funds to wages and thus determines a more general indicator characterizing the growth of the prosperity of the people, that is, the real per capita income, then respectively these indicators are closer to the increase rates of labor productivity. However, in all instances it is essential that the growth of labor productivity outstrip both the growth of monetary wages and the real income of the public.

Changes in Labor Productivity and Wages (in %)

	Social labor produc- tivity	Average wages of employees in national income	Average wages of employees with addition of pay- ments and benefits from public con- sumption funds	Real per capita income
Increase over 1971-1980 For each percentage of increase in social labor productivity there was an increase in the cor- responding indicators of	47	38 0.81	41 0.87	46 0.98

At the same time, there have been instances of violating the ratios set in the plans between the increase in labor productivity and wages. Such violations are due primarily to the nonfulfillment of plan quotas for the growth of labor productivity. The share of associations and enterprises in the individual sectors which did not fulfill the designated quotas exceeds by 1.3-1.5-fold and more the proportional amount of enterprises and associations which did not fulfill the plan for the production volume. The plan of measures relating to new equipment is not systematically fulfilled. There still are frequent instances when the sectors producing the implements of labor and means of production substantially increase prices for new products without a corresponding rise in labor productivity from its use or another useful effect from its application. With the nonfulfillment of the plans for the growth of labor productivity, at many associations and enterprises an increase in wages occurs in the same or in even greater amounts than is envisaged in the planning calculations.

The ministries and departments as before make unjustified downward adjustments of the labor productivity quotas without any change in the amount of money going for wages. The relatively low, lax quotas for the growth of labor productivity in the first quarters of the planning period also do not contribute to correct proportions between the increase in labor productivity and wages. In a number of instances, this leads to unjustified expenditures of the wage fund and to the obtaining of bonuses by enterprise workers for this period with the nonfulfillment of plan quotas as a whole for the year. Moreover, many economic leaders, instead of seeking out internal reserves for an increase in labor productivity by improving working conditions and bettering organization, endeavor to solve these problems chiefly by wage payments and in a number of instances these payments are not linked to the results of labor activity.



The overcoming of the above-noted shortcomings is possible primarily on the basis of the consistent and comprehensive implementation of measures aimed at intensifying production in all the sectors and on all levels of management. Here of major significance is the better use of such an effective "lever" for influencing production as wages and the consistent improvement in their organization.

## II

Ensuring optimum ratios between the increase in labor productivity and the increased amounts of average wages in the forthcoming period requires a thorough consideration of the economic and social features in social development as these have come to exist at present, when the decisions of the 26th CPSU Congress have posed the task of completing in the 1980's the transition to intensive management methods in all areas and spheres of activity. Under these conditions it is essential to ensure the more rapid growth of the end national economic results in comparison with increasing the utilized resources--labor, material and financial. The urgency of solving this problem is becoming particularly acute in line with the sharp drop in the increase in labor resources in the 1980's as well as the planned reduction in the planned growth rate of capital investments. The decline in the increase of labor resources is caused, on the one hand, by a certain reduction in the number of persons entering working age due to the unfavorable demographic consequences of the war, and on the other, by the significant increase in the number of persons who during these years are receiving the right to retire on pension. As for capital investments, in the 11th Five-Year Plan their increase is planned at 10 percent in comparison with 29 in the Ninth. Consequently, in order to reach the indicators planned in the area of the growth of national prosperity, it is essential in every possible way to save on live and embodied labor and at the same time to consistently improve the use of fixed productive capital, receiving the greatest return from each ruble of capital investments.

Considering this, the 11th Five-Year Plan envisages a rise in the growth rate of labor productivity by approximately one-third in such leading national economic sectors as industry, construction and agriculture. As a whole for the national economy, by increasing labor productivity, a savings of approximately 17 million workers should be obtained in comparison with 15 million during the years of the Tenth Five-Year Plan. In industry, around 90 percent of the increase in the volume of produced product is to come from an increase in productivity while in agriculture and construction all the planned increase in the production volumes should come from this. As a whole for the national economy, the increased productivity of social labor should produce 90 percent of the increase in national income.

For increasing labor productivity and solving social problems, it is important to accelerate the decline in the use of manual and heavy physical labor in the sectors of the production sphere, in a majority of the nonproductive sectors and particularly in the service sphere. As is known, at present a specific comprehensive program is being worked out to reduce the use of manual labor. It should envisage measures which even in the 1980's would basically eliminate its use in all areas to undergo mechanization first. Thus, in accord with the Food

Program, prior to 1990 full mechanization should basically be complete in crop raising and livestock raising and the sectors of the food industry should be converted to a new technical base.

The measures to sharply reduce manual jobs have a double impact on the ratio between the increases in labor productivity and wages. On the one hand, the mechanization of labor is a most important prerequisite for raising labor productivity and, on the other, it frees a portion of the employees for use in other sectors and in other production areas. Thus, another opportunity is created to save in the wage fund in the corresponding types of production while at the same time prerequisites arise for using a portion of the wages to encourage highly productive labor.

In the coming years the task has been set of providing a rise in the production volume at existing enterprises, as a rule, with the same or even smaller number of personnel. In a majority of instances the designated task can be carried out on the basis of increasing labor efficiency in basic, auxiliary and also subsidiary production. In a number of industrial sectors the persons employed in auxiliary jobs comprise 50 percent and more of the total number of workers. The measures to free them, as a rule, require 2-3- and in individual instances 4-5-fold less expenditures than in basic production. Consequently, the effect from such measures per ruble of expenditures is significantly higher.

Obviously the distribution of money going into new construction and, particularly, for reconstruction, modernization and the technical reequipping of production should be made in such a manner as to not only ensure an increase in the volume and improve the quality of the produced product, but also the greatest possible savings of live labor considering the above-stated ideas.

An important area for the saving of labor is the ubiquitous dissemination of advanced forms and methods of work which ensure a rise in production and an improvement in product quality with the same or less number of personnel. In the course of carrying out the measures to improve the economic mechanism in the various sectors, the enterprises have received a number of additional rights and the possibility of encouraging the use of such forms in organizing labor. Thus, on the sovkhozes and kolkhozes for encouraging an accelerated rise in labor productivity, from the savings in the wage fund they can now pay extra to the workers for combining professions and carrying out the set amount of work with a reduced number of personnel. For the workers this can amount up to 70 percent of the wage rate (salary) and for the engineers, technicians and white collar personnel up to 50 percent of their salaries.

The wider use of the brigade form for the organizing and encouraging of labor and the increased effectiveness of their work make it possible to improve the ratio between the growth of labor productivity and wages. As is seen from the experience of the Kaluga Turbine Plant, Uralmashzavod [Urals Machinery Plant], the Leningrad Optical Equipment Association, the Novokramatorsk Machine Building Plant imeni V. I. Lenin and many other enterprises, the correct organization of the brigade form of labor makes it possible to not only increase labor productivity (by an average of 10-12 percent) but also strengthens and makes more apparent the dependence of the amount of wages upon the indicators for the growth of production efficiency. Unfortunately, by the beginning of 1982, out of the total

number of workers employed in brigades, only a little more than one-half employed the uniform rate for piece workers and a uniform normed quota for time workers while wages were paid according to the end results of the work. Less than 10 percent of the workers employed in brigades had converted to brigade cost accounting.

Obviously, in carrying out further work in the area of developing the brigade organization of labor, particular attention should be paid, first of all, to the quality aspect of the question, that is, to the material, technical and economic support for the brigades, the dissemination of the most effective forms of the brigades and the further development and strengthening of brigade cost accounting, including such an effective form as the brigade contract.

A number of important circumstances must be taken into consideration in determining the other component of the designated ratio, that is, the changes in the amounts of average wages. It is a question primarily of the need to strengthen the effect of wages and material incentives for labor as a whole on accelerating the increase rates of labor productivity and on improving product quality. For this in the coming years, the corresponding, rather high increase rates for average wages are planned. Over the years of the 11th Five-Year Plan the increase in average wages will provide an increase in income averaging 25 rubles a month per employee and almost 300 rubles a year.

The objective prerequisites for a substantial increase in the amount of wages and as a whole the entire receipts of worker families are to be created in the coming years due to the ongoing increase in the production volume of national income. According to the 11th Five-Year Plan this is to increase by 18 percent and as a whole for the 1980's by at least 1.4-fold. At the same time, on the basis of carrying out the measures aimed at improving the use of fixed productive capital, reducing the labor intensiveness of production and so forth, there is to be a further rise in the share of the consumption fund in national income. While in 1970, this share was 71.3 percent and by the start of 1981 had increased up to 75.3 percent, by the end of the 11th Five-Year Plan it should rise to 78 percent. Merely due to this, in 1985, it is possible to channel significant additional funds into increasing material prosperity. Here a relatively smaller portion of the general rise in funds earmarked for wages will go to increase the number of workers than in the previous five-year plans, when there was a rather active involvement of the labor resources in social production.

The improved ratios between the increase in labor productivity and wages can be achieved on the basis of strengthening the tie between wages and the end results of production activities and, particularly, with the indicators for production efficiency. For this, it is essential to utilize more completely than previously the rights and opportunities existing for the associations and enterprises in developing initiative and to increase their interest in adopting taut plans and in employing progressive forms for the organization of labor. At the same time, at many enterprises in the chemical, construction, road and certain other sectors of machine building and in the food industry, the workers who combine professions, broaden the service zones and carry out the planned work volume with a smaller number of personnel and who receive incentives by the corresponding additions to the wage rates and salaries comprise not more than 5-10 percent of all the employees.



The condition of norming also has an active influence upon the indicators for the growth of labor productivity and its relationship to changes in wages. In recent years, a number of ministries and departments have paid less attention to this very important problem. A very significant portion of the existing standards do not conform to the condition of equipment or to the organization of production. Although many of these standards are termed technically sound, in essence they in no way differ from experimental statistical ones. A number of progressive intersectorial and sectorial norms are virtually not employed or are employed with such correction factors which sharply weaken their tautness to 25-30 percent and more. Labor norming for time workers, engineers, technicians and white collar personnel has still not been sufficiently developed. Thus, the labor of approximately one-quarter of the time workers in industry is not normed at all and many of the employed norms are of poor quality. There have been frequent instances when the revising of the standards has not been done promptly and has been of poor quality. Organizational and technical measures which reduce labor intensiveness are carried out, but the standards remain unchanged. As a result of shortcomings in labor norming, an increase in the percentage of overfulfillment of the standards does not correspond to a rise in labor productivity and leads to an unjustified increase in wages. Such facts have been noted at enterprises in the petrochemical, meat-dairy industry and in a number of other sectors.

The link between wages and labor productivity is weakened also in those instances when the bonus payments which by their very nature are most closely tied to the end results are turned into a means of a "mechanical" rise in wages.

The eliminating of the shortcomings in the organization of wages and in labor norming requires systematic and planned work by the associations and enterprises and, in particular, the fuller use of the rights granted them. They can employ increased rates in jobs using progressive standards, they can encourage a prompt and effective revision of the standards by using a portion of the savings obtained for wages and they can encourage work with a smaller number of personnel. Broad rights have been granted also to the enterprises in the area of determining the bonus indicators, conditions and amounts considering the particular features of production and so forth. As practice has shown, the greatest effect comes from combining measures to improve wages with the introduction of the scientific organization of labor, the improving of labor norming and the use of progressive production methods.

The carrying out of centralized measures to increase wages and improve their organization also helps to strengthen the link between productivity and wages.

The most important measure being carried out in the 11th Five-Year Plan in accord with the decisions of the 26th CPSU Congress is the increased minimum wages, rates and salaries for employees, primarily in the production sectors of the national economy. However, in a number of instances the opinion is still encountered that a rise in the rates and salaries does not influence the strengthening of the tie between wages and labor productivity. Such an underestimate of the role of the rate system is completely unjustified. Certainly it must be considered that, in the first place, wages paid according to the rates determine the effectiveness of the other wage elements, since they all depend



directly or indirectly upon the amounts of the wage rates and salaries. Secondly, a wage rate significantly influences the quality of labor norming, since the level of the wage rates and their conformity to the existing amounts of wages largely determines the tautness of the employed standards and in introducing new wage conditions there is an across-the-board revision of the standards and the broad introduction of progressive standards and norms for labor expenditures. Thirdly, the encouraging of the qualification and quality of labor through the rates tells directly on the growth of labor productivity. This is particularly apparent under the conditions of accelerated scientific and technical progress. Fourthly, the intersectorial and interregional regulation of wages using the rates and regional coefficients and surpayments is one of the important levers for national economic balancing and this largely determines the rise in production efficiency.

At the present stage, when the decisions of the 26th CPSU Congress have determined the task of utilizing the internal production reserves existing in the associations, organizations, enterprises and sectors to raise the rates and salaries, the link between wages and the growth of labor productivity is becoming evermore tangible.

In determining the proportions between the growth of labor productivity and wages it is also essential to consider the changes in the general management conditions, that is, the entire system of measures to improve planning and strengthen the impact of the economic mechanism on the effectiveness and quality of work.

From the viewpoint of labor productivity, it is extremely important to determine the savings in the labor expenditures on product output which actually depend upon the work results of the collectives. In this regard, it is hard to overestimate the importance of the indicator for normed net product (NNP). This indicator makes it possible, first of all, to provide a unity in determining the savings of live labor in all levels of management: from the national economy as a whole down to the enterprise and association. Directly at the enterprises the use of NNP strengthens the unity in the internal production planning of labor productivity from the work areas and brigades up to the shop and enterprise as a whole. At the same time, the NNP indicator excludes the influence of the material intensiveness of production on the labor productivity indicator.

As the first results of the mass employment of NNP in 1982 indicate, the enterprises and associations which employ this indicator, as a rule, achieve better results in their operations, particularly from the viewpoint of fulfilling the quotas for increasing labor productivity. However, there are definite shortcomings in the practice of its use. In particular, the NNP indicator does not properly consider the incentive surcharges for new, highly effective products and products with the state Quality Mark. There are definite difficulties in calculating the NNP, particularly in estimating the nonbasic product, and so forth.

As for the link of wages with end production results and with increasing labor productivity, it is substantially strengthened with the use of the normative method of wage planning and particularly with the setting of wage norms calculated per ruble of NNP. Precisely this indicator best characterizes the

intrinsic labor efforts of the enterprise collectives. At the same time, as research indicates, in a majority of instances the norms per ruble of product are formally determined: by a simple dividing of the absolute wage fund by the production volume while the absolute wage fund itself is calculated using the previous method from the achieved level. At the same time, the purpose of the normative method of wage planning is precisely to proceed from the labor intensiveness of production and to consider the state of labor norming and use technically sound standards for labor expenditures. Only in this instance is the soundness of the wage norms ensured and their effect on the collective work indicators strengthened.

For optimizing the ratios between the increase in labor productivity and average wages as well as in the aim of increasing the incentive role of wages, of primary significance are the measures being planned for coming years to more fully meet the commodity and material resources for the growing income of the workers. With a substantial increase in the production of consumer goods and various services, there are definite difficulties in supplying the population with meat products and also certain high fashion, high quality consumer goods. In the 1970's, the volume of savings deposits increased from 46.6 billion rubles to 156.5 billion rubles. This shows broader opportunities for the public to accumulate the necessary funds for purchasing relatively expensive consumer durables, for tourist trips and so forth. At the same time, the increased deposits is partially explained by the dissatisfaction of demand for a number of goods.

Improving the balance of income and expenditures by the public requires above all a further broadening of production and an improvement in the quality of consumer goods. As a result of the consistent implementation of the Food Program by 1990 we plan to satisfy the needs of the Soviet people (in accord with rational standards) for such basic food products as meat, animal and vegetable oils, eggs, fish, groats, candy goods and so forth. In the coming years, there will be a substantial broadening of the production of nonfood consumer goods, particularly those in increased demand. For this, during the 11th Five-Year Plan there is to be a certain more rapid rise in the industrial product of the "B" group in comparison with the "A" group. The various sectors providing paid services to the public will also be developed rapidly. It is a question of the greatest possible broadening of production and improving in the quality of services in the consumer service sectors, developing the leisure sphere including organized tourism and so forth.

A consideration of all the factors which in their aggregate influence the ratio in the growth of labor productivity and wages makes it possible on a national economic scale to forecast as economically and socially sound an increase in average wages by at least 0.7-0.8 percent for each percent of increase in labor productivity while for real per capita income it will be 0.8-0.9 percent for each percent. Here the guideline could be the ratios adopted for the 11th Five-Year Plan, where for each percent in the increase of social labor productivity there is 0.81 percent of a rise in average wages for employees in the national economy and 0.93 percent for an increase in real per capita income.

As a whole, for the dynamic and balanced development of the national economy, of the greatest importance is the ubiquitous, on all levels, establishing and

maintaining of optimum ratios between the increases in labor productivity and average wages with the more rapid increase rates for labor productivity.

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DEMOGRAPHY

CENSUS FIGURES ON NUMBER OF FAMILIES IN RSFSR

Moscow VESTNIK STATISTIKI in Russian No 10, Oct 82 pp 72-80

[See chart on following page]



[Census: "Number of Families in Autonomous Republics, Krays and Oblasts Grouped According to Their Size"]

Continuation of the publication of the results of the census in the magazine Vestnik statistiki. For the beginning see No 2, 6-12 for 1980, No 1, 2, 4.

	Number of Families	In Particular Families Grouped of the Following Number of People Living Together										Average Size of the Family (Number of the Family Living Together)
		2										
		2	3	4	5	6	7	8	9	10 and more	Number of Families	
<b>RUSSIA</b>	955,406	246,948	259,675	248,448	117,167	56,166	21,967	9,810	5,197	2,055	21,812	3.6
Urban population	556,181	152,419	172,119	152,287	58,106	27,162	10,112	4,817	2,675	1,015	7,215	3.6
Rural population	399,225	194,529	87,556	58,880	39,060	19,004	11,855	4,993	2,522	1,040	14,597	3.6
<b>Belarusian ASSR</b>	127,555	34,597	31,587	36,055	12,651	6,376	2,658	1,156	629	220	10,912	3.6
Urban population	93,791	21,086	20,680	26,993	12,551	6,376	2,658	1,156	629	220	10,912	3.6
Rural population	33,764	13,511	10,907	9,058	4,100	2,000	900	403	199	100	9,000	3.6
<b>Ingoshskaya ASSR</b>	130,896	62,823	58,874	59,286	46,641	16,018	7,070	3,161	1,795	720	9,917	3.6
Urban population	116,014	60,203	56,609	57,071	46,411	16,018	7,070	3,161	1,795	720	9,917	3.6
Rural population	14,882	2,620	2,265	2,215	2,230	1,000	300	100	100	100	1,000	3.6
<b>Chuvashskaya ASSR</b>	156,011	17,610	29,609	29,157	26,909	24,055	18,921	11,104	7,911	1,900	16,156	3.6
Urban population	95,585	16,540	25,622	23,920	21,051	19,015	14,008	9,122	6,550	1,100	16,156	3.6
Rural population	60,426	1,070	3,987	3,989	5,858	5,040	4,913	2,000	1,361	800	9,000	3.6
<b>Kalmyckaya ASSR</b>	68,646	13,216	17,115	16,595	9,115	6,894	2,708	1,371	642	110	5,011	3.7
Urban population	28,132	6,296	7,595	7,358	4,033	3,103	1,066	511	226	110	5,011	3.7
Rural population	40,514	6,920	9,520	9,237	5,082	3,791	1,642	860	416	0	4,000	3.5
<b>Karelo-Finskaya ASSR</b>	148,486	56,905	61,615	69,168	16,297	4,971	1,600	600	240	100	1,000	3.1
Urban population	148,486	56,905	61,615	69,168	16,297	4,971	1,600	600	240	100	1,000	3.1
Rural population	0	0	0	0	0	0	0	0	0	0	0	3.1
<b>Komi ASSR</b>	219,275	78,770	91,678	75,059	21,119	1,161	1,300	565	95	57	617	3.1
Urban population	219,275	78,770	91,678	75,059	21,119	1,161	1,300	565	95	57	617	3.1
Rural population	0	0	0	0	0	0	0	0	0	0	0	3.1
<b>Mordovskaya ASSR</b>	175,681	21,419	21,273	17,569	4,703	1,666	1,012	616	192	126	1,000	3.5
Urban population	175,681	21,419	21,273	17,569	4,703	1,666	1,012	616	192	126	1,000	3.5
Rural population	0	0	0	0	0	0	0	0	0	0	0	3.5
<b>Nenetskiy AO</b>	8,717	28,715	18,509	25,950	9,467	2,767	819	318	101	54	587	3.6
Urban population	8,717	28,715	18,509	25,950	9,467	2,767	819	318	101	54	587	3.6
Rural population	0	0	0	0	0	0	0	0	0	0	0	3.6
<b>Nur-Ostanskaya ASSR</b>	256,987	11,652	39,117	31,998	9,189	2,190	681	228	81	45	486	3.3
Urban population	256,987	11,652	39,117	31,998	9,189	2,190	681	228	81	45	486	3.3
Rural population	0	0	0	0	0	0	0	0	0	0	0	3.3
<b>Novosibirskaya ASSR</b>	141,211	62,624	31,641	25,965	16,063	8,180	1,865	1,796	706	432	4,580	3.6
Urban population	141,211	62,624	31,641	25,965	16,063	8,180	1,865	1,796	706	432	4,580	3.6
Rural population	0	0	0	0	0	0	0	0	0	0	0	3.6
<b>Orenburgskaya ASSR</b>	81,055	25,999	26,620	26,011	12,606	5,657	2,786	910	541	162	8,200	3.6
Urban population	81,055	25,999	26,620	26,011	12,606	5,657	2,786	910	541	162	8,200	3.6
Rural population	0	0	0	0	0	0	0	0	0	0	0	3.6
<b>Permianskaya ASSR</b>	632,517	216,709	236,846	217,711	101,521	46,463	19,885	7,879	2,610	1,401	15,806	3.6
Urban population	632,517	216,709	236,846	217,711	101,521	46,463	19,885	7,879	2,610	1,401	15,806	3.6
Rural population	0	0	0	0	0	0	0	0	0	0	0	3.6
<b>Primorskiy Krai</b>	402,081	79,636	65,781	60,175	65,606	28,960	14,492	5,972	1,907	916	9,671	3.9
Urban population	402,081	79,636	65,781	60,175	65,606	28,960	14,492	5,972	1,907	916	9,671	3.9
Rural population	0	0	0	0	0	0	0	0	0	0	0	3.9
<b>Samarskaya ASSR</b>	26,731	12,716	13,794	11,304	7,612	4,652	1,959	1,017	1,018	800	8,710	4.1
Urban population	26,731	12,716	13,794	11,304	7,612	4,652	1,959	1,017	1,018	800	8,710	4.1
Rural population	0	0	0	0	0	0	0	0	0	0	0	4.1
<b>Sverdlovskaya ASSR</b>	12,161	5,441	6,106	6,190	2,811	1,396	503	279	176	66	706	3.5
Urban population	12,161	5,441	6,106	6,190	2,811	1,396	503	279	176	66	706	3.5
Rural population	0	0	0	0	0	0	0	0	0	0	0	3.5
<b>Tatarstan ASSR</b>	271,386	102,748	109,136	95,476	67,161	36,892	2,961	1,479	584	104	6,102	3.5
Urban population	271,386	102,748	109,136	95,476	67,161	36,892	2,961	1,479	584	104	6,102	3.5
Rural population	0	0	0	0	0	0	0	0	0	0	0	3.5
<b>Chelnyinskaya ASSR</b>	293,778	58,446	29,966	27,072	27,405	19,278	4,158	2,100	1,508	757	10,611	3.6
Urban population	293,778	58,446	29,966	27,072	27,405	19,278	4,158	2,100	1,508	757	10,611	3.6
Rural population	0	0	0	0	0	0	0	0	0	0	0	3.6
<b>Chuvashskaya ASSR</b>	179,156	80,216	79,962	75,296	38,169	19,117	10,153	6,188	3,320	1,800	8,965	3.9
Urban population	179,156	80,216	79,962	75,296	38,169	19,117	10,153	6,188	3,320	1,800	8,965	3.9
Rural population	0	0	0	0	0	0	0	0	0	0	0	3.9
<b>Chukotskiy AO</b>	102,111	21,737	26,212	21,050	26,006	15,637	9,001	2,900	1,516	1,554	15,441	3.6
Urban population	102,111	21,737	26,212	21,050	26,006	15,637	9,001	2,900	1,516	1,554	15,441	3.6
Rural population	0	0	0	0	0	0	0	0	0	0	0	3.6
<b>Yakutskaya ASSR</b>	306,511	68,927	65,181	66,208	10,107	9,999	5,164	2,100	1,771	1,551	15,441	4.2
Urban population	306,511	68,927	65,181	66,208	10,107	9,999	5,164	2,100	1,771	1,551	15,441	4.2
Rural population	0	0	0	0	0	0	0	0	0	0	0	4.2
<b>Altayskiy Krai</b>	790,581	15,917	16,922	15,749	62,501	6,515	3,965	2,100	1,771	1,551	15,441	3.2
Urban population	790,581	15,917	16,922	15,749	62,501	6,515	3,965	2,100	1,771	1,551	15,441	3.2
Rural population	0	0	0	0	0	0	0	0	0	0	0	3.2



	Number of families	In Particular Families Counting of the Following Number of People Living Together						Average Size of the Family				
		2	3	4	5	6	7	8	9	10 and more	Number of the Family Living Together	
Volgogradskaya Oblast	646,084	228,227	214,182	161,406	55,088	16,617	4,856	1,462	758	548	6,148	3.2
Urban population	485,866	156,189	161,311	119,137	36,558	9,904	2,642	794	528	219	2,316	3.2
Rural population	160,218	76,038	52,871	42,269	18,530	6,713	2,214	668	400	149	3,732	3.2
Volgogradskaya Oblast	341,555	114,216	107,223	78,710	24,137	8,991	2,216	1,215	476	327	3,498	3.2
Urban population	198,189	59,209	69,137	50,634	14,317	5,140	1,216	708	471	168	2,752	3.2
Rural population	143,366	55,005	38,086	28,076	10,820	3,851	1,000	507	285	159	2,746	3.2
Westernoblastskaya Oblast	640,271	246,626	207,199	142,318	56,427	19,180	5,355	2,075	766	585	6,276	3.2
Urban population	361,716	116,114	124,253	83,204	28,512	10,958	3,254	1,122	406	282	3,005	3.2
Rural population	278,555	130,512	82,946	59,114	27,915	8,222	2,101	709	380	173	3,271	3.2
Westernoblastskaya Oblast	316,987	119,043	108,761	78,976	24,926	9,273	2,466	1,108	407	282	3,005	3.2
Urban population	185,368	63,076	61,658	42,269	14,317	5,140	1,216	708	471	168	2,752	3.2
Rural population	131,619	55,987	47,103	36,707	10,600	3,851	1,000	507	285	159	2,746	3.2
Yaroslavlskaya Oblast	781,608	271,794	246,626	178,753	61,405	20,102	5,355	2,075	766	585	6,276	3.2
Urban population	571,118	191,011	210,095	142,318	47,915	16,617	4,856	1,462	758	548	6,148	3.2
Rural population	210,490	80,783	136,531	36,438	13,493	3,483	1,000	507	285	159	2,746	3.2
Yaroslavlskaya Oblast	520,915	166,807	170,305	124,568	44,793	15,127	4,226	1,224	454	329	3,520	3.2
Urban population	350,616	114,216	107,223	78,710	24,137	8,991	2,216	1,215	476	327	3,498	3.2
Rural population	170,299	63,076	61,658	42,269	14,317	5,140	1,216	708	471	168	2,752	3.2
Yaroslavlskaya Oblast	31,761	8,186	7,637	5,934	2,102	758	246	146	101	41	1,148	3.2
Urban population	21,059	6,490	5,957	4,552	1,658	594	193	103	70	27	1,137	3.2
Rural population	10,702	1,696	1,680	1,382	444	154	56	43	31	14	131	3.2
Kaliningradskaya Oblast	221,262	66,264	78,217	51,622	15,930	5,568	1,578	512	208	113	1,303	3.2
Urban population	187,526	49,441	62,017	40,960	10,863	3,851	1,000	507	285	159	2,746	3.2
Rural population	33,736	16,823	16,200	10,662	5,067	1,717	575	255	94	40	632	3.2
Kaliningradskaya Oblast	443,092	160,878	151,849	108,091	37,207	12,712	3,567	1,265	464	329	3,520	3.2
Urban population	303,610	103,408	100,091	66,211	21,173	7,255	2,431	864	511	311	2,217	3.2
Rural population	139,482	57,470	51,758	41,880	16,034	5,452	1,136	390	253	108	1,303	3.2
Kaliningradskaya Oblast	276,854	92,476	90,204	61,334	21,202	7,255	2,431	864	511	311	2,217	3.2
Urban population	169,550	50,282	48,755	31,440	10,863	3,851	1,000	507	285	159	2,746	3.2
Rural population	107,304	42,194	41,449	29,894	10,339	3,404	1,000	507	285	159	2,746	3.2
Kaliningradskaya Oblast	105,304	25,204	24,855	16,548	5,067	1,717	575	255	94	40	632	3.2
Urban population	82,087	20,473	19,499	12,712	4,226	1,265	431	146	88	40	594	3.2
Rural population	23,217	4,381	5,356	3,836	823	292	144	108	66	31	438	3.2
Kaliningradskaya Oblast	18,061	4,381	4,381	2,835	1,000	355	140	75	42	21	138	3.2
Urban population	9,173	2,187	2,187	1,382	444	154	56	43	31	14	131	3.2
Rural population	8,888	2,194	2,194	1,453	556	181	89	32	11	7	107	3.2
Kaliningradskaya Oblast	5,346	1,170	1,170	758	246	94	41	21	11	5	138	3.2
Urban population	3,586	781	781	516	185	65	23	11	6	3	138	3.2
Rural population	1,760	389	389	243	91	29	10	10	5	2	100	3.2
Kaliningradskaya Oblast	784,281	271,794	246,626	178,753	61,405	20,102	5,355	2,075	766	585	6,276	3.2
Urban population	571,118	191,011	210,095	142,318	47,915	16,617	4,856	1,462	758	548	6,148	3.2
Rural population	213,163	80,783	136,531	36,438	13,493	3,483	1,000	507	285	159	2,746	3.2
Kaliningradskaya Oblast	443,935	160,878	151,849	108,091	37,207	12,712	3,567	1,265	464	329	3,520	3.2
Urban population	303,610	103,408	100,091	66,211	21,173	7,255	2,431	864	511	311	2,217	3.2
Rural population	139,482	57,470	51,758	41,880	16,034	5,452	1,136	390	253	108	1,303	3.2
Kaliningradskaya Oblast	276,854	92,476	90,204	61,334	21,202	7,255	2,431	864	511	311	2,217	3.2
Urban population	169,550	50,282	48,755	31,440	10,863	3,851	1,000	507	285	159	2,746	3.2
Rural population	107,304	42,194	41,449	29,894	10,339	3,404	1,000	507	285	159	2,746	3.2
Kaliningradskaya Oblast	105,304	25,204	24,855	16,548	5,067	1,717	575	255	94	40	632	3.2
Urban population	82,087	20,473	19,499	12,712	4,226	1,265	431	146	88	40	594	3.2
Rural population	23,217	4,381	5,356	3,836	823	292	144	108	66	31	438	3.2
Kaliningradskaya Oblast	18,061	4,381	4,381	2,835	1,000	355	140	75	42	21	138	3.2
Urban population	9,173	2,187	2,187	1,382	444	154	56	43	31	14	131	3.2
Rural population	8,888	2,194	2,194	1,453	556	181	89	32	11	7	107	3.2
Kaliningradskaya Oblast	5,346	1,170	1,170	758	246	94	41	21	11	5	138	3.2
Urban population	3,586	781	781	516	185	65	23	11	6	3	138	3.2
Rural population	1,760	389	389	243	91	29	10	10	5	2	100	3.2
Kaliningradskaya Oblast	784,281	271,794	246,626	178,753	61,405	20,102	5,355	2,075	766	585	6,276	3.2
Urban population	571,118	191,011	210,095	142,318	47,915	16,617	4,856	1,462	758	548	6,148	3.2
Rural population	213,163	80,783	136,531	36,438	13,493	3,483	1,000	507	285	159	2,746	3.2
Kaliningradskaya Oblast	443,935	160,878	151,849	108,091	37,207	12,712	3,567	1,265	464	329	3,520	3.2
Urban population	303,610	103,408	100,091	66,211	21,173	7,255	2,431	864	511	311	2,217	3.2
Rural population	139,482	57,470	51,758	41,880	16,034	5,452	1,136	390	253	108	1,303	3.2
Kaliningradskaya Oblast	276,854	92,476	90,204	61,334	21,202	7,255	2,431	864	511	311	2,217	3.2
Urban population	169,550	50,282	48,755	31,440	10,863	3,851	1,000	507	285	159	2,746	3.2
Rural population	107,304	42,194	41,449	29,894	10,339	3,404	1,000	507	285	159	2,746	3.2
Kaliningradskaya Oblast	105,304	25,204	24,855	16,548	5,067	1,717	575	255	94	40	632	3.2
Urban population	82,087	20,473	19,499	12,712	4,226	1,265	431	146	88	40	594	3.2
Rural population	23,217	4,381	5,356	3,836	823	292	144	108	66	31	438	3.2
Kaliningradskaya Oblast	18,061	4,381	4,381	2,835	1,000	355	140	75	42	21	138	3.2
Urban population	9,173	2,187	2,187	1,382	444	154	56	43	31	14	131	3.2
Rural population	8,888	2,194	2,194	1,453	556	181	89	32	11	7	107	3.2
Kaliningradskaya Oblast	5,346	1,170	1,170	758	246	94	41	21	11	5	138	3.2
Urban population	3,586	781	781	516	185	65	23	11	6	3	138	3.2
Rural population	1,760	389	389	243	91	29	10	10	5	2	100	3.2
Kaliningradskaya Oblast	784,281	271,794	246,626	178,753	61,405	20,102	5,355	2,075	766	585	6,276	3.2
Urban population	571,118	191,011	210,095	142,318	47,915	16,617	4,856	1,462	758	548	6,148	3.2
Rural population	213,163	80,783	136,531	36,438	13,493	3,483	1,000	507	285	159	2,746	3.2
Kaliningradskaya Oblast	443,935	160,878	151,849	108,091	37,207	12,712	3,567	1,265	464	329	3,520	3.2
Urban population	303,610	103,408	100,091	66,211	21,173	7,255	2,431	864	511	311	2,217	3.2
Rural population	139,482	57,470	51,758	41,880	16,034	5,452	1,136	390	253	108	1,303	3.2
Kaliningradskaya Oblast	276,854	92,476	90,204	61,334	21,202	7,255	2,431	864	511	311	2,217	3.2
Urban population	169,550	50,282	48,755	31,440	10,863	3,851	1,000	507	285	159	2,746	3.2
Rural population	107,304	42,194	41,449	29,894	10,339	3,404	1,000	507	285	159	2,746	3.2
Kaliningradskaya Oblast	105,304	25,204	24,855	16,548	5,067	1,717	575	255	94	40	632	3.2
Urban population	82,087	20,473	19,499	12,712	4,226	1,265	431	146	88	40	594	3.2
Rural population	23,217	4,381	5,356	3,836	823	292	144	108	66	31	438	3.2
Kaliningradskaya Oblast	18,061	4,381	4,381	2,835	1,000	355	140	75	42	21	138	3.2
Urban population	9,173	2,187	2,187	1,382	444	154	56	43	31	14	131	3.2
Rural population	8,888	2,194	2,194	1,453	556	181	89	32	11	7	107	3.2
Kaliningradskaya Oblast	5,346	1,170	1,170	758	246	94	41	21	11	5	138	3.2
Urban population	3,586	781	781	516	185	65	23	11	6	3	138	3.2
Rural population	1,760	389	389	243	91	29	10	10	5	2	100	3.2
Kaliningradskaya Oblast	784,281	271,794	246,626	178,753	61,405	20,102	5,355	2,075	766	585	6,276	3.2

	Number of Families	In Particular Families Constituting of the Following Number of People Living Together										Average Size of the Family (Number of Family Living Together)	
		2	3	4	5	6	7	8	9	10 and More	Number of Families in Them		
Leningradskaya obl. and .....	619,400	144,762	144,762	93,107	28,661	7,049	1,945	654	269	191	7,109	1.1	
Urban population .....	265,447	61,861	61,861	40,189	16,279	4,161	1,056	364	148	103	1,154	1.1	
Rural population .....	354,253	82,901	82,901	52,918	12,382	2,888	889	285	121	88	955	1.1	
Lipetskaya obl. and .....	129,787	31,095	31,095	19,151	6,551	1,666	467	150	54	37	416	1.2	
Urban population .....	101,180	26,147	26,147	15,102	5,102	1,266	337	112	40	28	416	1.2	
Rural population .....	28,607	5,948	5,948	4,049	1,449	400	130	38	14	9	250	1.2	
Magadanskaya obl. and .....	111,070	28,407	28,407	17,107	6,107	1,607	407	149	59	41	211	1.1	
Urban population .....	102,409	26,461	26,461	16,161	5,161	1,361	361	129	49	35	206	1.1	
Rural population .....	8,661	1,946	1,946	1,046	1,046	246	46	20	10	6	506	1.1	
Chukotka by Autonomous Obl. and .....	10,967	2,716	2,716	1,716	1,016	416	116	41	21	11	416	1.1	
Urban population .....	2,279,851	512,114	512,114	312,114	112,114	32,114	8,114	2,114	614	114	414	1.1	
Rural population .....	1,756,018	1,204,742	1,204,742	704,742	204,742	70,742	18,742	5,742	1,742	514	1,154	1.1	
Khanty-Mansi Autonomous Obl. and .....	1,321,254	312,114	312,114	112,114	41,114	16,114	6,114	2,114	614	114	414	1.1	
Urban population .....	434,804	104,114	104,114	64,114	24,114	9,114	3,114	1,114	314	114	414	1.1	
Rural population .....	265,440	108,000	108,000	48,000	17,000	7,000	2,000	700	200	100	300	1.1	
Yamalo-Nenets Autonomous Obl. and .....	212,916	61,114	61,114	31,114	11,114	4,114	1,114	414	114	41	214	1.1	
Urban population .....	95,554	25,114	25,114	15,114	5,114	2,114	614	114	41	21	214	1.1	
Rural population .....	207,362	36,000	36,000	16,000	6,000	2,000	700	200	100	50	300	1.1	
Chukotka by Autonomous Obl. and .....	208,147	51,114	51,114	31,114	11,114	4,114	1,114	414	114	41	214	1.1	
Urban population .....	127,907	31,114	31,114	16,114	6,114	2,114	614	114	41	21	214	1.1	
Rural population .....	77,040	20,000	20,000	15,000	5,000	2,000	700	200	100	50	300	1.1	
Khanty-Mansi Autonomous Obl. and .....	205,473	51,114	51,114	31,114	11,114	4,114	1,114	414	114	41	214	1.1	
Urban population .....	102,155	25,114	25,114	15,114	5,114	2,114	614	114	41	21	214	1.1	
Rural population .....	103,318	26,000	26,000	16,000	6,000	2,000	700	200	100	50	300	1.1	
Khanty-Mansi Autonomous Obl. and .....	171,480	41,114	41,114	21,114	8,114	3,114	1,114	414	114	41	214	1.1	
Urban population .....	137,480	31,114	31,114	16,114	6,114	2,114	614	114	41	21	214	1.1	
Rural population .....	34,000	10,000	10,000	5,000	2,000	700	200	100	50	20	100	1.1	
Khanty-Mansi Autonomous Obl. and .....	550,065	131,114	131,114	81,114	31,114	11,114	4,114	1,114	414	114	414	1.1	
Urban population .....	317,457	71,114	71,114	41,114	16,114	6,114	2,114	614	114	41	214	1.1	
Rural population .....	232,608	60,000	60,000	40,000	15,000	5,000	1,500	500	150	70	150	1.1	
Khanty-Mansi Autonomous Obl. and .....	282,111	65,114	65,114	35,114	12,114	4,114	1,114	414	114	41	214	1.1	
Urban population .....	128,816	31,114	31,114	16,114	6,114	2,114	614	114	41	21	214	1.1	
Rural population .....	153,995	34,000	34,000	19,000	6,000	2,000	700	200	100	50	300	1.1	
Khanty-Mansi Autonomous Obl. and .....	405,956	91,114	91,114	51,114	18,114	7,114	2,114	614	114	41	214	1.1	
Urban population .....	219,091	51,114	51,114	26,114	9,114	3,114	1,114	414	114	41	214	1.1	
Rural population .....	186,865	40,000	40,000	25,000	9,000	3,000	1,000	300	100	50	300	1.1	
Khanty-Mansi Autonomous Obl. and .....	506,114	118,482	118,482	70,482	25,482	9,482	3,482	1,182	482	182	482	1.1	
Urban population .....	201,965	47,086	47,086	27,086	10,086	3,086	1,086	386	136	66	386	1.1	
Rural population .....	42,552	12,407	12,407	7,407	2,407	807	207	77	27	17	207	1.1	
Khanty-Mansi Autonomous Obl. and .....	10,415	2,916	2,916	1,916	616	116	41	11	1	1	41	1.1	
Urban population .....	12,117	3,117	3,117	1,617	517	117	41	11	1	1	41	1.1	
Rural population .....	208,400	47,300	47,300	27,300	10,300	3,300	1,300	400	130	60	400	1.1	
Khanty-Mansi Autonomous Obl. and .....	109,810	24,114	24,114	14,114	5,114	2,114	614	114	41	21	214	1.1	
Urban population .....	8,117	2,117	2,117	1,117	417	117	41	11	1	1	41	1.1	
Rural population .....	361,065	87,266	87,266	50,266	18,266	7,266	2,266	766	266	106	766	1.1	
Khanty-Mansi Autonomous Obl. and .....	312,514	71,114	71,114	41,114	16,114	6,114	2,114	614	114	41	214	1.1	
Urban population .....	162,513	31,114	31,114	16,114	6,114	2,114	614	114	41	21	214	1.1	
Rural population .....	490,362	118,400	118,400	70,400	25,400	9,400	3,400	1,100	400	100	400	1.1	
Khanty-Mansi Autonomous Obl. and .....	306,606	68,114	68,114	38,114	13,114	5,114	1,114	414	114	41	214	1.1	
Urban population .....	171,967	41,114	41,114	21,114	8,114	3,114	1,114	414	114	41	214	1.1	
Rural population .....	134,639	27,000	27,000	17,000	5,000	2,000	700	200	100	50	300	1.1	
Khanty-Mansi Autonomous Obl. and .....	15,827	4,114	4,114	2,114	814	214	614	114	41	21	214	1.1	
Rural population .....	13,040	3,000	3,000	1,000	400	100	40	10	5	5	100	1.1	

\*Including the urban population under the jurisdiction of the Leningrad gorsovet





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